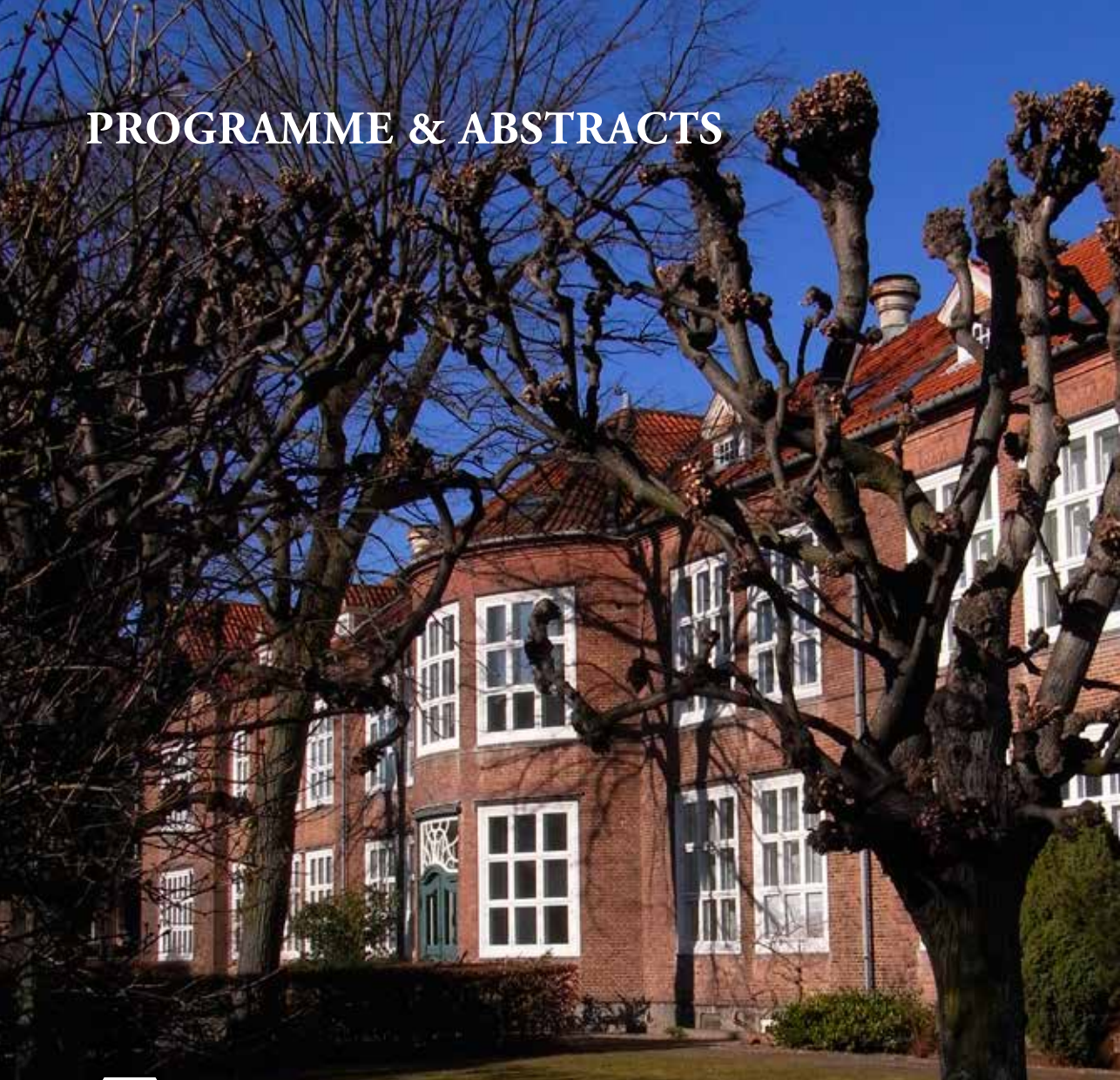
PROGRAMME & ABSTRACTS



# ECTP 2013

## 1st EUROPEAN CONGRESS ON TATTOO AND PIGMENT RESEARCH

**November 13-14, 2013**
**Bispebjerg University Hospital ◆ Copenhagen ◆ Denmark**

**WWW.ECTP2013.ORG**

ECTP 2013

# 1st EUROPEAN CONGRESS ON TATTOO AND PIGMENT RESEARCH

**November 13-14, 2013**
**Copenhagen ◆ Denmark**

**With the inauguration of**
**the European Society of Tattoo and Pigment Research**

# DEAR PARTICIPANT

We are pleased to welcome all of you to this 1st European Congress on Tattoo and Pigment research (ECTP 2013) in Copenhagen, Bispebjerg University Hospital, Denmark. We feel privileged that the congress is attended by participants of different backgrounds and from many countries. The hospital build in 1913 is honored to host the congress and welcome you after a century of service to human health.

The 1st ECTP congress in Copenhagen aims to expose cutting edge research on tattoos and industrial pigments ranging from basic research to clinical research including health aspects and social sciences.

The scientific program offers, thanks to eminent experts and speakers a number of excellent sessions on tattoo epidemiology and practices, composition and safety of tattoo ink, complications of tattooing, treatment of tattoo reactions by surgery and lasers, tattoos and infection and much more. The program includes more that 40 oral presentations and more than 15 posters with the latest research in the field.

We hope you will enjoy the conference as well as the capital of Denmark, Copenhagen. Copenhagen oozes of history and effortlessly combines old and new, preserving its 1,000-year history yet always looking to the future with open arms, hearts and minds. We hope the November climate will be gentle with us and allow you the opportunity to enjoy the many possibilities, the capital offers.

We, the faculty hope to provide an excellent platform for sharing of knowledge as well as an active networking environment. The research field is in the sunrise and certainly needs your support to bloom. A new research society shall be inaugurated right at this Copenhagen congress, and a 2nd ECTP is lined up.

Enjoy this 1st conference on tattoo and pigment research, warm welcome to Copenhagen!

On behalf of the organizing committee
Jørgen Serup, congress chair

Bispebjerg University Hospital
Department of Dermatology

PHOTO
Jørgen Serup

# ECTP ORGANISATION

**Local Organising Committee**
Jørgen Serup, ECTP2013 Chair, Professor, DMSc,
Bispebjerg University Hospital, Copenhagen, Denmark

Bo Jørgensen, Chief Surgeon,
Bispebjerg University Hospital, Copenhagen, Denmark

Nicklas Raun Jacobsen, Ph.D,
National Research Centre for the Working Environment,
Copenhagen, Denmark

Per Axel Clausen, Ph.D,
National Research Centre for the Working Environment,
Copenhagen, Denmark

**Scientific Faculty**
All questions regarding the Scientific Faculty and
scientific contents please contact
Professor Jørgen Serup, Congress Chairman,
Bispebjerg University Hospital, Copenhagen, Denmark
Joergen.Vedelskov.Serup@regionh.dk

*Congress Chairman:* Jørgen Serup, Professor, DMSc,
Bispebjerg University Hospital, Copenhagen, Denmark

*Vice Chairman:* Nicolas Kluger, MD,
Montpellier University Hospital, Montpellier, France
& University of Helsinki, Finland

Werner Aberer, Professor, Dr. med.,
Medical University of Graz, Graz, Austria

Maurice A. Adatto, MD, Founder & Medical Director,
SKINPULSE Dermatology, Laser & Beauty Centers,
Geneva, Switzerland

Enzo Berardesca, MD, Professor,
Director Clinical Dermatology,
San Gallicano Dermatological Institute, Rome, Italy

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University of Regensburg, Germany

Christa De Cuyper, MD,
Dermatology Department, AZ Sint-Jarr, Brugge, Belgium

Ana M Giménez-Arnau, MD,
Hospital del Mar. Universitat Autònoma de Barcelona,
Spain

Marléne Isaksson, DMSc, Associate Professor,
Lund University, Malmoe, Sweden

Bo Jørgensen, Chief Surgeon,
Bispebjerg University Hospital, Copenhagen, Denmark

Andreas Katsambas, DMSc, Past-President of EADV,
University of Athens, Andreas Sygros Hospital,
Athens, Greece

Jana Kazandjieva, MD, Ph.D, Ass. Professor,
Medical University, Sofia, Bulgaria

Moshe Lapidoth M.D, MPH.,
Rabin Medical Center, Petach Tikva, Israel

Malinauskiena MD, DMSc, Vilnius University,
Antakalnio Hospital Alelrgy Center, Vilnius, Lithuania

Anna Zalewska-Janowska, MD,
Dept. of Dermatology, Medical University of Lotz

Ester Serra MD,
Hospital de la Santa Creu i Sant Pau, Barcelona,
Spain (co-opted)

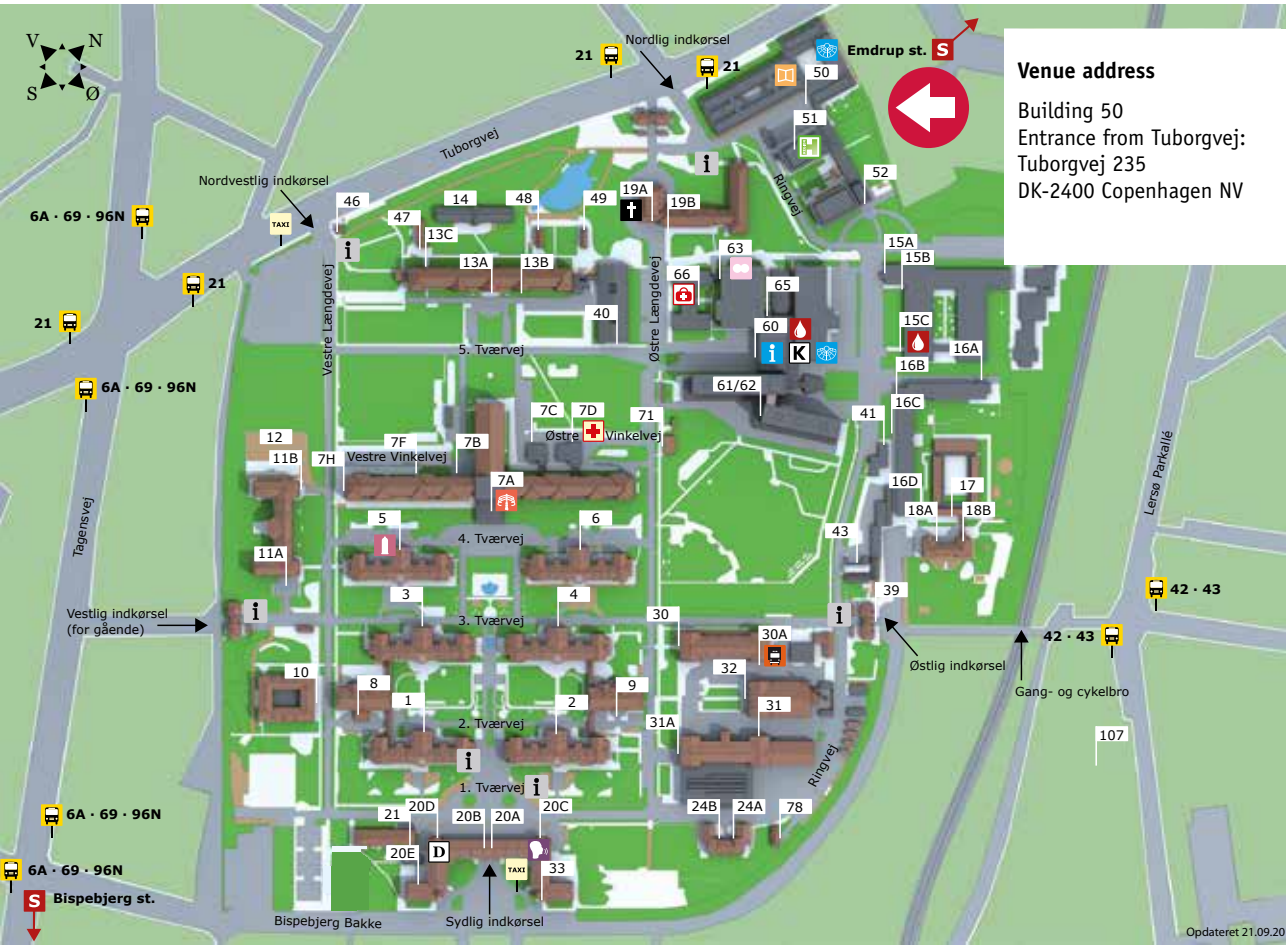
Juan Franciser Silvestra MD,
Hospital Universitario de Alicante, Spain (co-opted)

**Conference Secretariat**
**Contact:**
Congress Secretariat
CAP Partner
info@cap-partner.eu
Tel: +45 7020 0305

# BISPEBJERG HOSPITAL

Bispebjerg Hospital

ECTP 2013




**Venue address**

Building 50
Entrance from Tuborgvej:
Tuborgvej 235
DK-2400 Copenhagen NV

www.bispebjerghospital.dk

# VENUE OVERVIEW

# EXHIBITOR OVERVIEW

| | | |
|---|---|---|
|  | **Biox Systems Limited**<br>Tel: +44 (0)845 8622129<br>lori@biox.biz<br>www.biox.biz | We manufacture the AquaFlux (condenser-chamber TEWL) for skin barrier measurements and the Epsilon for contact imaging of dielectric permittivity. |
|  | **Chemotechnique**<br>Diagnostics<br>Tel: +4640466077<br>info@chemotechnique.se<br>www.chemotechnique.se | 32 years focusing on contact dermatitis has resulted in a world leading position in R&D and producing patch test products. +550 haptens & IQ Ultra™ Test chambers (high patient comfort & preloadable). Cooperation with ie EECDRG, ICDRG, NACDG to advance diagnosis of contact dermatitis. |
|  | **Cortex Technology**<br>Tel: +45 9857 4100<br>cortex@cortex.dk<br>www.cortex.dk | Cortex is a leading manufacturer of dedicated dermatological instrumentation – in particular high resolution cross-sectional ultrasound imaging equipment. |
|  | **CTL Bielefeld GmbH**<br>Tel: +49-521-4008289-0<br>info@ctl-bielefeld.de<br>www.ctl-tattoo.net<br>www.ctl-bielefeld.de | CTL Bielefeld GmbH is a chemical-technological laboratory in Bielefeld, Germany. It is specialized in tests on tattoo colours. CTL® has been performing such tests for over a decade. |
|  | **Fotona**<br>Tel: +386 15009 100<br>info@fotona.com<br>www.fotona.com | Fotona is a pioneering, reasearch based laser technology company established in 1964. The company's aim is to fulfill practitioner's needs by providing effective treatment solutions. |
|  | **Intenze**<br>Tel: +43 (316) 225923<br>michi@intenzeproducts.eu<br>www.intenzeproducts.eu | Intenze Products is a revolutionary leader in the global tattoo community and strives to create the world's safest and highest performing tattoo ink. |
|  | **ProInkCare by Medico**<br>Tel: (+45) 45 66 20 93<br>info@proinkcare.com<br>www.proinkcare.com | PROINKCARE are specialized care products for tattooed skin developed in collaboration with leading Danish dermatologists and in consultation with the Danish tattoo artist guild. |
|  | **MediTech Scandinavia**<br>Tel: +45 4636 3452<br>info@meditech-scandinavia.com<br>www.meditech-scandinavia.com | Scandinavia's leading laser distributor – also in laser tattoo removal.<br>See us about PicoSureTM & RevLite® world-class Q-switched lasers. |
|  | **Servita**<br>Tel: +46 40 470101<br>info@servita.se<br>www.servita.se<br>www.tatt2away.se | Distributors in Sweden for DermaQuest Skin Care, lasers from Energist Ltd and Tatt2away in Europe. |
|  | **TIME – Tattoo Ink Manufacturer of Europe**<br>Tel: +49 7273 800 521<br>contact@TIME-online.eu<br>www.TIME-online.eu | TIME is a non-profit organization of European tattoo ink manufacturer with the aim to produce safe tattoo inks and permanent make-up colours. |
|  | **Wheelsbridge AB**<br>Tel: +46 (0)708 765190<br>info@wheelsbridge.se<br>www.wheelsbridge.se | The Tissue Viability Imager TiVi700 can "see beyond" the top layer of the skin and collect information about the microcirculation and other skin parameters. |

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# PROGRAMME

## NOVEMBER 13TH

| | | |
|---|---|---|
| 13:00-13:25 | **OPENING OF THE CONGRESS** | |
| | Welcome by<br>Andreas Katsambas, Past President of the European Academy of Dermatology and Venerology (EADV) | |
| | Welcome by<br>Jørgen Serup, Prof., Congress chair | |
| | Welcome by<br>Nicolas Kluger, MD, Congress vice-chair | |
| 13:25-14:45 | **SESSION 1: TATTOO EPIDEMIOLOGY, PRACTICES AND CHALLENGES**<br>Chairs: Wolfgang Bäumler & Christa De Cuyper | |
| | 1 Tattoo epidemiology, trends and challenges in the year 2013, Europe and overseas countries | Nicolas Kluger |
| | 2 Tattoos and pigments in the US: Complications, implications, and advocacy | Neerav Desai |
| | 3 Regulation of tattooing across Europe and internationally | Andy Schmidt |
| | 4 Tattooing in tattoo parlors and by back stage operators, practices and experiences, the professional Tattooist's view, France | Tin-Tin |
| | 5 The professional tattoo artist's view, Denmark | Liz Kierstein |
| | 6 Unique start – Training program for Tattooists, Finnish experience | Säde Sonck |
| | 7 Good manufacturing practice of tattoo inks in Europe | Ralf Michel |
| 14:45-15:05 | *Coffee break* | |
| 15:15-16:25 | **SESSION 2: MEDICAL AND OTHER COMPLICATIONS OF TATTOOING**<br>Chairs: Andreas Katsambas & Nicholas Kluger | |
| | 8 Medical and other complications of tattooing | Christa de Cuyper |
| | 9 Clinical classification of tattoo reactions | Jørgen Serup |
| | 10 Remarkably high prevalence of mild complaints in tattoos including photosensitivity hitherto not recognized | Katrina H. Carlsen |
| | 11 Red ink is the big problem in tattoos | Charlotte Naeyaert |
| | 12 Histopatholoty and immune histochemistry of red tattoo reactions | Trine Høgsberg |
| | 13 Pseudolymphomatous tattoo reactions | Enzo Berardesca |
| 16:25-17:15 | **SESSION 3: TATTOOS AND THE TATTOOED**<br>Chairs: Enzo Berardesca & Anne Laumann | |
| | 14 Tattoo, psyche and psychopathology | Anna Zalewska-Janowska |
| | 15 Quality of life and subjective complaints of tattoo reactions measured by DLQI and the ISS score of itch | Katrina H. Carlsen |
| | 16 Cosmetic tattoos, who, why, where and when? Technique and complications | Christa De Cuyper |
| | 17 Safety in tattooing | Rita Molinaro |
| 17:15-18:00 | **INAUGURATION OF THE EUROPEAN SOCIETY OF TATTOO AND PIGMENT RESEARCH (ESTP)** | |
| 19:30 | CONFERENCE DINNER at Radisson Blu Falconer Hotel, Frederiksberg<br>(not included in registration fee) | |

## NOVEMBER 14TH

| | | |
|---|---|---|
| 08:30-9:35 | **SESSION 4: TREATMENT OF TATTOO REACTIONS BY SURGERY AND LASERS**<br>Chairs: Agneta Troilius & Maurice Adatto | |
| | 18 Laser removal of tattoos and the challenge of treating tattoos with chronic reactions | Agneta Troilius |
| | 19 Laser tattoo removal: a few tips & tricks | Maurice A. Adatto |
| | 20 Introduction of dermatome shaving of tattoo reactions, rationale, technique and reactions | Bo Jørgensen |
| | 21 Dermatome shaving of tattoo reactions, medical follow up including patient's satisfaction | Mitra Sepehri |
| | 22 Preoperative non invasive depth detection of dermal infiltration of tattoo reactions by high-frequency ultrasound scanning | Jacob Tolstrup |
| 9:35-10:30 | **SESSION 5: TATTOOS AND INFECTION: MICROBIAL AGENTS, SOURCE OF INFECTION AND TREATMENT AND PREVENTION**<br>Chairs: Anna Zalewska-Janowska & Christa De Cuyper | |
| | 23 Tattooing and infection: Tattoo ink is a vector for international spread of serious infections | Jørgen Serup |
| | 24 Microbiological quality and product labelling of tattoo inks | Lucia Bonadonna |
| | 25 Cutaneous inoculation of nontuberculous Mycobacteria during professional tattooing | Charlotte Hurabielle |
| | 26 Rare infections in tattoos | Sam Dekeyser |
| | 27 Hygiene and prevention of infections in the Netherlands; effect of regulation, control and vigilance | Thijs Veenstra |
| 10:30-11:10 | *Coffee break* | |
| 11:10-12:30 | **SESSION 6: PHYSICAL AND CHEMICAL COMPOSITION OF TATTOO INK STOCK PRODUCTS**<br>Chairs: Jørgen Serup & Urs Hauri | |
| | 28 Keynote Lecture: Review of tattoo pigment chemistry and metabolism, in situ deposition in skin and suggested systemic exposure | Wolfgang Bäumler |
| | 29 Tattoo inks in general usage contain nanoparticles | David Löf |
| | 30 Particles, additives and contaminants of tattoo inks: analytical challenges | Per Axel Clausen |
| | 31 Identification of pigments and tattoo ink ingredients by pyrolysis-gas chromatography-mass spectrometry (Py-GC/MS) | Ines Schreiver |
| | 32 Analysis of metals in tattoo colorants | Gerald Prior |
| | 33 Analysis of PAH, chromium and nickel in tattoo inks | Gerd Mildau |
| | 34 Application of Raman spectroscopy as a potential fast screening technique of tattoo inks and reactions in skin biopsies | Morten Køcks |
| | 35 Towards manufacturing of high-quality inks | Michael Dirks |
| 12:30-13:30 | *Lunch* | |
| 13:30-14:35 | **SESSION 7: TATTOO INKS, FROM THEORETICAL CARCINOGENICITY, MUTAGENICITY AND TERATOGENICITY TO VALID PREVENTIVE STRATEGIES**<br>Chairs: Annegret Blume & Nicholas Kluger | |
| | 36 Survey on skin cancer arising in tattoos as reported in the world literature: induced by pigment or coincidental? | Nicolas Kluger |
| | 37 Toxicology of nanoparticles: ROS production, genotoxicity and mutagenicity caused by Carbon Black | Nicklas Raun Jacobsen |
| | 38 Aromatic amines in tattoo inks: surveillance activities in Italy | Manuela Agnello |

| | | | |
|---|---|---|---|
| | 39 | Positive or negative lists for organic pigments in tattoo inks and the contribution of analytics towards an improved legislation | Urs Hauri |
| | 40 | Health effect assessment of chemical substances in tattoo ink | Elsa Nielsen |
| | 41 | Tattoo inks from a regulatory toxicology point of view: Challenges and possible course of action | Annegret Blume |
| 14:35-15:25 | **SESSION 8: TATTOOS AND ALLERGY**<br>Chairs: Ana Gimenez-Arnau & Marléne Isaksson | | |
| | 42 | Allergy patch testing in suspected allergic tattoo reactions | Marléne Isaksson |
| | 43 | Which substance is an actual allergen in azo dyes? | Laura Malinauskiene |
| | 44 | Review of experiences from azo textile dyes and allergy testing: the challenge of testing multiple industrial dyes of low purity and high complexity | Ana Giménez-Arnau |
| | 45 | How does the allergic tattoo reaction really look, and how to test for allergy? | Jørgen Serup |
| | 46 | Henna tattoos, PPD allergy and cross sensitization | Jana Kazandjieva |
| 15:25-15:45 | | *Coffee break* | |
| 15:45-16:25 | **SESSION 9: PANEL DISCUSSION: TOWARDS SAFER TATTO INKS AND PRACTICES** | | |
| | 47 | Tattooing, "top-down", "buttom-up" and "mix regulatory strategies in the global scene | Jørgen Serup |
| | | Panel discussion | |
| | **POSTER SESSION** | | |
| | 1 | Local itching and swelling three days after tattooing with yellow and green colors in a young woman, known to be contact allergic to aluminium | Anette Gente Lidholm |
| | 2 | Case report: lichenoid reaction in a red tattoo and contact allergy to aluminium | Ann Pontén |
| | 3 | Laser induced contactallergy in a black tattoo | Christa De Cuyper |
| | 4 | Staphylococcal scalded skin syndrome (SSSS) proceeded by impetigo in a tattoo on the left forearm. A rare but serious complication | Carsten Sauer Mikkelsen |
| | 5 | Aspergillus fumigatus cutaneous infection on a home-made tattoo | Nicolas Kluger |
| | 6 | Spread of genital warts by tattoo needle inoculation | Katrina H. Carlsen |
| | 7 | Permanent makeup and risk of herpes virus infection | Katrina H. Carlsen |
| | 8 | Massive pseudoepitheliomatous hyperplasia in a tattoo. A rare but serious complication or an underreported and unregulated health hazard? | Gudjon L. Gunnarsson |
| | 9 | A case of pseudoepitheliomatous hyperplasia to tattoos | Antonella Tammaro |
| | 10 | Melanoma on tattoos: two cases illustrating possible fortuitous association | Nicolas Kluger |
| | 11 | Clinical classification of tattoo reactions | Jørgen Serup |
| | 12 | Chronic tattoo reaction: proposal of a management algorithm | Nicolas Kluger |
| | 13 | Perception of tattoos among physicians: the example of anesthesiologists, tattoos and epidural analgesia | Nicolas Kluger |
| | 14 | Nanoscale analysis of tattoo ink in vitro using Atomic Force Microscopy (AFM) | Colin Grant |
| | 15 | Tattoo materials available on the Belgian market | Davy D'hollander |
| | 16 | Surveillance of tattooing in Italy | Manuela Agnello |
| | 17 | Sun safety ink! | Anne Laumann |

# GENERAL INFORMATION

## Venue
Bispebjerg Hospital, Uddannelsescentret/Center of Education,
Main Lecture Hall, entrance 50 (easiest access from Tuborgvej)

## Conference Hours
*13 November*
Registration: 11.00-18:00
Exhibition: 12:00-16:00
Scientific programme: 13:00-18:00

*14 November*
Registration: 8:00-12:00
Exhibition: 8:30-16:00
Scientific programme: 8:30-16:25

## Certificates of attendance
Certificates of attendance can be collected at the registration desk 14 November 2013.

## Cloakroom/luggage
The cloakroom with room for luggage is located in the auditorium

## Lunch and coffee
Lunch and coffee is included in the conference registration fee. It is served in the exhibition area.

## Internet
Free Wi-Fi is available in the conference area.
A Wi-Fi code can be collected at the registration desk.

## Entitlements
Registration for the conference includes conference bag, programme and abstracts, admission to the full conference programme, coffee breaks and lunch 14 November.

## Transport
Taxi: From Kastrup Airport to Bispebjerg Hospital: Travel Time 30 minutes, estimated price 300 DKK
S-Train: The station Emdrup is located close by. The station Bispebjerg is located in walking distance, but further away than Emdrup.
Bus: Bus 21 stops close to the venue. Busses 42, 43 and 6A stop in walking distance from the venue.

## Information for speakers
Please bring your presentation on a USB stick.
Please upload your presentation to the computer in the auditorium. A folder with each session will indicate where you should place the presentation.
A technician will be present to assist you if you have any problems.
Please upload your presentation before your session starts!

Please note that we do not allow use of personal laptops for presentations.
At the end of the conference, all presentations will be deleted in order to secure that no copyright issues will arise.

## Information for poster presenters
Poster mounting: Poster can be mounted November 13th 2013 between 11:00-14:00

Poster removal: Poster can be removed after the last session which ends November 14th, 2013 at 16:20.
The congress secretariat provides equipment for setting up the posters on the boards.

Visit to the posters: Participants are encouraged to visit the posters in the coffee and lunch breaks and contact the main author during the congress when it is feasible. Participants can attach their business card to the poster and expect to be contacted by the author during the congress or later as it may be appropriate.

Billede Falkoner Hotel/middagssal??

# SOCIAL EVENT

**Conference dinner 13th November 2013 19:30** (Not included in registration fee)
The conference dinner at the Radisson Blu Falconer Hotel in Copenhagen will start with an aperitif, followed by a delicious 3 course menu.
The Radisson Blu Falconer Hotel is situated in the middle of Fredriksberg, a fashionable part of Copenhagen filled with large, flourishing parks and excellent shopping opportunities.

Dress code: Casual

Address: Radisson Blu Falconer Hotel, Falkoner Allé 9, 2000 Frederiksberg

Transport to conference dinner:
By metro: The metro station"Frederiksberg st." is located only 100m from the restaurant.
Busses 18, 71, 73, 74 and 9A stop nearby.
Or find your way using www.rejseplanen.dk (available in English)

ESTP research

European Society for Tattoo and Pigment Research

# ABOUT ESTP

## European Society on Tattoo and Pigment research

We are pleased to announce that the new society, European Society on Tattoo and Pigment research, is to be inaugurated during the 1st ECTP Conference, 13-14 November 2013.

The main objectives of the ESTP are to advance academic research on tattoos, to deliver independent expert advice, to educate the medical community and other groups of professionals in all aspects of tattoos, to advance the manufacturing, distribution and sales of safer tattoo ink and to develop and support research projects, guidelines and publications.

The ESTP will organize a recurring conference in the field to secure a high level of knowledge sharing and networking.

Membership of the ESTP will give the member a number of benefits: Reduced conference fee, membership diploma as well as more benefits to be developed by the society.

All participants at the ECTP 2013 are invited to inaugurate the new society. It will take place in the auditorium, 13 November 2013 at 17:25.

Applicants signing in as members of ESTP during the ECTP2013 will receive a certificate nominating them as founding member of ESTP.

We hope you will take this unique opportunity to be a part of the inauguration of a new society and to enjoy the benefits of being a member of the society.

Society statues are available as an appendix to the conference program.

# ABSTRACTS

# 1

## TATTOO EPIDEMIOLOGY, TRENDS AND CHALLENGES IN THE YEAR 2013, EUROPE AND OVERSEAS COUNTRIES

**Nicolas Kluger**[1]

[1]*Helsinki University Central Hospital; (Helsinki, Finland)*.

For the past 20 years, tattooing has gained tremendous popularity in Europe. In Germany, 8,5% of the population (aged between 14 and 90 yo) would have a tattoo. Similar trends are found in France according to a recent poll (10%). But the prevalence increases especially among the young, up to 15 to 25% according to the country. Such trend is important as it raises two different issues:

1) the young may not always perceive risks of tattooing, especially if they have congenital diseases such as haemophilia or a cardiopathy and

2) this very same population will age with their tattoos raising potential consequences for further management of various conditions. Besides, the tattoo market includes a whole industry including tattooists, shop managers, suppliers and ink manufacturers. Tattooists are also exposed daily to tattoo inks with potential health issues. Proper education and formation of tattooists is mandatory and should go beyond infections control. National laws and legislation should be adapted to the tattooists' activities both to ensure safety for the customers and that the tattoo industry can work properly.

# 2

## TATTOOS AND PIGMENTS IN THE US: COMPLICATIONS, IMPLICATIONS AND ADVOCACY

**Neerav Desai**[1]

[1]*Vanderbilt University; (Nashville, US).*

This presentation will focus on current areas of research and development on tattoos and other pigmented body art in the United States. The estimates of tattoo prevalence are as low as 10-13% in youth or as high as 50% in military personnel. The scope of the research centers on dermatologic issues, psychosocial implications of body art, and advocacy issues.

Dermatologic complications associated with tattoos are one focus of research in the US. In 2013, English et al. published a review of inflammatory, infectious, and neoplastic reactions to tattoos. They emphasize that clinicians should consider systemic reactions and complications such as sarcoidosis, lupus, psoriasis, urticaria and vasculitis. In our review we recommend obtaining a bacterial culture while considering empiric antibiotics for tattoo infections. In particular pseudomonas cellulitis and mycobacterial infections are reported throughout the literature. Henna tattoos pose a risk for allergic sensitivity due to para-Phenylene-diamine and can result in prolonged hyper or hypopigmentation. Kent et al published a review of laser tattoo removal emphasizing careful pre selection criteria, management of expectations of laser removal, and monitoring for complications. Pulse laser treatment of tattoos can pose a risk for development of melanoma and other neoplasms as discussed in many case reports.

Medical providers should understand the psychosocial implications of body art. Most youth pursue tattoos to express individuality; however some use it as a marker of physical or psychological trauma. According to recent studies, 50% of youth (15-25) pursuing body art are altered with substances including alcohol, marijuana, amphetamines, and narcotics. Two notable exceptions to this are prisoners and members of military. Carroll et al concluded that teenagers with one or more tattoos are at higher risk for gateway drug use, hard drug use, sexual behavior risk, and suicide behavior risk.

Researchers are focusing on advocacy and legal issues surrounding patient safety and tattoo practices and standards. Each state has rules on consent for tattoos and piercings by minors ranging from written parental consent, to presence of a parent with accompanying proof of guardianship documentation. Illegal tattooing persists due to lack of enforcement and pervasiveness of unregistered tattoo and piercing parlors. Our colleagues are working on an AAP position statement for unauthorized tattoos and piercings in adolescents for 2014. The Alliance of Professional Tattooists promotes safety, apprenticeship, and other regulations in an effort to improve quality and awareness through their website www.safe-tattoos.com

# 3

## REGULATION OF TATTOOING ACROSS EUROPE AND INTERNATIONALLY

**Andy Schmidt**[1]

[1]*German Organization of Tattooists DOT; (Willich-Neersen, Germany)*.

The regulation of tattooing across Europe and internationally is a problematic issue. Neither the regulations of the cosmetic industry nor the guidelines of medicinal products can be used for this kind of intervention in the skin. Therefore tattooing needs own regulations for hygiene standards and – very important – for inks and pigments.

The aims of the German Association of Professional Tattoo Artists (D.O.T.) are therefore the development of quality standards, the implementation of hygiene standards for tattoo studios, general research and a close cooperation with national and international authorities. Background of all new regulations should be the protection of the interests of tattoo artists, specifically to avoid a dermal contamination of customers by tattoo inks on the one and to beware a contamination of artists by tattoo inks by inhalation of pigments while working. At the moment, no legal safety in selling/using of tattoo colours is given in Europe. Tattoo artists buy colours only in good faith because they have no possibility to analyze the colours. Therefore regulations to increase the safety of tattooing are extremely necessary. Our primary focus deals with the evaluation of standard methods for testing of colours and to prepare a positive list for usable and safe tattoo colours. Toxicological tests for ingredients of colours as usual for food, cosmetics and pharmaceutical products should be performed by manufacturers of pigments and ingredients and by the tattoo ink manufacturers.

In the last two years the D.O.T. developed the national hygiene standards for Germany (rated also by the AWMF and used by many health offices all over Germany). Now we are in progress to bring these national hygiene standards for tattoo studios in legal force for other European countries.

In conclusion, there are no sufficient regulations of tattooing in Europe and internationally but the German Association of Professional Tattoo Artists is working hard to prepare this together with politics and science, because tattoos have arrived in the centre of European society.

# 4

## TATTOOING IN TATTOO PARLORS AND BY BACK STAGE OPERATORS, PRACTICES AND EXPERIENCES, THE PROFESSIONAL TATTOOIST'S VIEW, FRANCE

**Tin-Tin**[1]

[1]*Syndicat National des Artistes Tatoueurs; (Paris, France)*.

Tattoo artist since 1984, Tin-Tin is the president of the SNAT (Syndicat National des Artistes Tatoueurs – Union of French Tattoo Artists), which he founded in 2003. In the mid 1980s there were about twenty tattoo artists in France, but the numbers have risen considerably since then. In Tatouage Magazine's first issue in 1997, they counted over 300 shops in the country. Today, over 3000 people work as full time tattoo artists, and there may even be 10 000 working illegally. In 2008, health regulations were established to regulate the profession, finally recognized by the State. A 21 hour hygiene training course is now required, as well as establishing ones business in accordance with the law, and a verification of the customer's health history prior to the tattoo is mandatory. Learning the profession of tattooing is traditionally either self-taught or done during an apprenticeship with a tattoo « master » and even sometimes both. Self-proclaimed 'schools' or 'learning centers' do exist, but the SNAT choses to not endorse such courses, which are rare and poorly supervised (often by crooks). The main goal of the SNAT is to bring tattoo professionals together for the defense and recognition of tattoo art in France, as well as the recognition of tattooists as professionals artists by the state and tax services. The SNAT has also established a Health Charter, which served as a model for the public health services until the 2008 regulations were established. Since 2010, the members of the SNAT are committed to respect the Charter, requiring them to not only comply with the law, but also to the artistic and creative approach to their work. Today, the SNAT has more than 1 100 members, with over 1 000 tattoo artists and other professionals (convention organizers, equipment suppliers and manufacturers), doctors and other health professionals, tattoo journalists and other benefactors (tattooed or not). Despite our previous work and collaboration with public authorities, the French Health Ministry issued regulations banning a list of substances in tattoo inks in March 2013 with no apparent grounds, as the population of tattooed people have not presented harmful symptoms in any considerable numbers. This ban goes against certain European regulations and may put the French tattooists in a difficult situation. A working group of doctors and providers are trying to negotiate with the Health Ministry to define new rules on the basis of studies and updated data.

# 5

## THE PROFESSIONAL TATTOO ARTISTS VIEW, DENMARK

**Liz Kierstein**[1]

[1]*Tattoo-Liz Tattoo Studio; (Copenhagen K, Denmark)*.

Tattoo-Liz, one of the first female tattoo artists in Denmark. Tattooing since 1989. Since 2002 Tattoo-Liz has tried to bring Artists, Authorities and Politicians together to work out Danish Standard rules for the trade. Closely cooperating with Department of Environment and Health regarding the new law and proposal in Denmark.

Internationally Trained and Organizer of 3 International Tattoo & Body Piercing Conventions (2000, 2001, 2002) in Denmark.

Since 2003 Certified Laser Technician specialized in tattoo removal (from Germany).

Member of DTL (Dansk Tatovør Laug) and UETA (United European Tattoo Artists).

Spokes person for the Danish Professional Independent Tattoo Artists, a non-profit-network enabling all professional tattooists getting valuable information.

10 years of hospital tattooing at Rigshospitalet, Herlev Hospital, Aalborg Hospital, Plastic Surgery and Burn Unit and connected to most of Danish private hospitals.

Tattooing specialized after surgery, skin diseases as Vitiligo. More than 5.000 cases without complications. Mainly areola tattooing after breast reconstruction and breast cancer, tattooing after plastic surgery, chemo-treatment, after accidents and burns.

Denmark has a great and proud Tattoo history starting out with only a few artists in the world famous Nyhavn Area with the late Frederik the 9th King of Denmark as one of the most honorable clients. Today estimated around 1200-1500 tattoo artists in Denmark, but due to the voluntary law nobody knows the correct number.

The back stage tattooing has exploded causing many severe cases of complications and young kids with poor quality homemade tattoos are unfortunately all over.

# 6

## UNIQUE START – TRAINING PROGRAM FOR TATTOOISTS, FINNISH EXPERIENCE

**Säde Sonck**[1]

[1]*Unique Art; (Hämeenlinna, Finland)*.

Unique Start - Tattoo artist's training programs courses:

- Drawing technique in tattooing and designing pictures by forms of the body
- Anatomy and skin
- Client service and psychology dealing with people
- Human engineering with the positions of working and health
- Taking care of my workstation, setting the new material and cleaning when contaminated
- Hygiene in a tattoo shop, Cross-contamination, sterilization of material
- Hygiene and Complication by Nicholas Kluger
- How to use autoclave
- Buying equipment, what do I need to have to do a good job and where to get it,
- A day of visiting tattoo equipment importer in Finland
- Making stencils by hand and with machine
- What are good tattoo colors
- Tattoo machine's mechanics and how to repair them
- Tattooing technique; Linework, coloring solid areas, shades
- Tattooing from A to Z in different materials like fake skin and fruits before working on skin
- Working on clients
- Creating a business course by Kiipula Technical school

7

## GOOD MANUFACTURING PRACTICE OF TATTOO INKS IN EUROPE

**Ralf Michel**[1]

[1]*Deep Colours! GmbH the inkfactory; (Neuburg am Rhein, Germany)*.

Tattoo inks in Europe are so called borderline products, non regulated by cosmetic or medical device directive.

As the product is injected under the skin, it is not a cosmetic product. The fact that it is implanted in the skin, stays there for more than 30 days and gets in contact with the blood and lymphatic systems indicates that it is close to a class IIb medical device.

Manufacturing safe tattoo inks will follow similar GMP guidelines like sterile pharmaceutical products or sterile medical devices class IIb. An established quality management system, regulations about personnel and the premise and equipment is required.

The documentation, the production and the quality control will guide the manufacturing of safe products. Outsourcing of activities, contract manufacturing and analysis by third parties needs to be regarded.

To ensure a continuous improvement of the product it is important to handle as well complaints about the product and manage product recalls in case of serious problems. Finally self inspections should be done to check the functionality of the quality system.

Production of safe tattoo inks will follow such guidelines and will ensure best consumer safety.

# 8

## MEDICAL AND OTHER COMPLICATIONS OF TATTOOING

**Christa De Cuyper**[1]

[1]*Dermatology AZ Sint Jan; (Brugge, Belgium)*.

Body art has been practiced throughout history by various cultures. In the last decades tattoos have become very popular in all social classes and ages groups. All body-modifying methods can lead to complications, which depend on the hygienic conditions in which the procedures are performed, on the training and the skills of the practitioner and on the materials used. Allergic reactions can be attributed to the substances used. Poor hygienic standards and careless procedures can result in localized infections but can also lead to severe life-threatening conditions or even result in irreversible damage. Blood-borne diseases can be transmitted (hepatitis B, C, HIV). Scarring, granuloma and keloid formation can occur. Interference with Magnetic Resonance Imaging has also been reported. Health care professionals should be aware of the complications that can arise from these procedures.

# 9

## CLINICAL CLASSIFICATION OF TATTOO REACTIONS

**Jørgen Serup**[1]

[1]*Department of Dermatology, Bispebjerg University Hospital, the "Tattoo Clinic"; (Copenhagen, Denmark)*.

**Aim**: The diagnosis of tattoos and tattoo reactions according to the WHO classification of diseases is obscure and need accuracy. Tattoos and tattoo reactions are coded under the group Morbi pigmentationis cutis alia, code L81.8E with no further specification. Diagnosis of tattoo reactions in the clinic relies on local tradition and individual conclusion by the dermatologist. Often the conclusion from biopsy and histopathology is simply translated into a clinical diagnosis. Descriptive patterns such as "lichenoid", "granulomatous" and "pseudolymphomatous" are non specific and non discriminative, and may coincide in the same biopsy. There is a need for a rational diagnosis classification system, which primarily relies on clinical signs and symptoms.

**Methods**: Based on a large material and broad intake of patients with tattoo reactions and adverse effects as observed in the Tattoo Clinic since 2008, the patients (n approx. 350, October 2013) were grouped into those with complaints or complications, and the complications were divided into infectious and non infectious complications. The subgroups were further specified into a number of entities. Final classification of allergic reactions awaits the conclusion of supplementary studies, which shall define simple clinical criteria for allergic tattoo reactions.

**Results**: The major groups of non infectious events were represented by "plateau" (lichen alike), papulo-nodular, hyperkeratotic-exophytic, ulcero-necrotic, photosensitivity, intermittent (urticaria alike), pigment leakage and lymphopathy, neuro-sensory, generalised/systemic, and miscellaneous reaction patterns. Reactions supposed to be allergic in nature displayed three different reaction patterns and included autoimmunisation with affection of normal skin. Infectious events were specified according to their clinical presentation and aetiology. Examples are discussed. Figures are displayed in a photo gallery included in the poster session.

**Conclusion**: A new system for clinical diagnosis of tattoo reactions and events argued from clinical signs and symptoms and the suggested pathomechanism is under development. Such system may better guide therapeutic interventions described in a decision tree or algorithm. A final and validated version may be proposed for inclusion in of the WHO disease classification system. Universal diagnosis standard is essential for progress of international research on tattoos and tattoo reactions.

# 10

## REMARKABLY HIGH PREVALENCE OF MILD COMPLAINTS IN TATTOOS INCLUDING PHOTOSENSITIVITY HITHERTO NOT RECOGNIZED

**Katrina Hutton Carlsen**[1], Jørgen Serup.

[1]*Department of Dermatology, Bispebjerg University Hospital, the "Tattoo Clinic"; (Copenhagen, Denmark)*.

**Aim**: To find the prevalence of complaints in tattoos with emphasis on chronic complaints, photosensitivity and photodynamic events.

**Methods**: Individuals sunbathing June to September 2011 at the beaches of Denmark were invited to participate since they are prone to report tattoos and sun habits reliably. Sun related and non sun related problems in tattoos were determined and participants' use of sunscreen. Skin type was categorized as motifs and colors associated with problems.

**Results**: Of 467 sunbathers, 146 (31.3%) had tattoos. 144 with 301 tattoos accepted inclusion. Complaints were experienced in 60/144 (42%), 31/60 (52%) were sun related as swelling (58%), itching/stinging/pain (52%) and redness (26%). Reactions independent of sun were 29/60 (48%), reactions to heat 12/29 (41%) and cold 1/29 (4%). Red, blue and black tattoos predominantly caused sun related complaints followed by the remaining colours. By number, problems in black tattoos dominated since black was far more frequent. Reaction to light was not confined to one chemical entity or class of pigment. Symptoms may switch on and off in seconds or be variable and of longer duration.

**Conclusions**: Complaints such as swelling, itching, stinging, pain and redness are common, predominantly in black and red tattoos but also in blue tattoos. Thus, dark tattoos absorbing a broad range of wavelengths predominate. Photochemical reaction to pigment or pigment metabolites in situ in the skin with induction of reactive oxygen species (ROS) is suggested to be one causative mechanism among others. In black tattoos induction of ROS may depend on aggregation of pigment nanoparticles.

# 11

## RED INK IS THE BIG PROBLEM IN TATTOOS

**Charlotte Naeyaert**[1], Christa de Cuyper[2]

[1]*Dermatology UZ Ghent; (Ghent, Belgium);* [2]*Dermatology AZ Sint Jan; (Brugge, Belgium).*

A 50 year old man developed a pruritic nodular skin reaction in the red component of a 5 year old tattoo on his left shoulder, contributed to sun exposure. It was accompanied with an eczematous reaction on both lower arms and hands. Other multi-colored tattoos didn't show any reaction. A foreign body reaction was found on histological examination. Initial treatment with local, intralesional and systemic corticosteroids and cyclosporin was not effective. With sun protection and local antibacterial treatment, regression of the eczema and a flattening of the nodules was obtained. Later on spontaneous ulceration, from with Streptococcus dysgalactiae was cultured, erupted. After 4 weeks treatment with systemic and local antibiotics, the lesions improved.

The last decades tattoos gained a lot in popularity. Dermal injection of tattoo pigment isn't without danger. Both inflammatory and infectious complications are numerous. Photosensitivity has been reported. Many, but not all of the pigment-based inflammatory reactions occur in the red areas of tattoos. Histology may show a lichenoid, pseudolymphomatous or granulomatous infiltrate either of the foreign body type or hypersensitivity type. The use of non-sterile materials enhance the risk of infections. Recent reports suggest atypical mycobacteria as an important cause of tattoo- related granulomatous infections. When encountering tattoo-induced complications, infections as well as hypersensitivity reactions need to be excluded. This is important even in long lasting tattoos.

# 12

## HISTOPATHOLOTY AND IMMUNE HISTOCHEMISTRY OF RED TATTOO REACTIONS

**Trine Høgsberg**[1], Birthe Mørck Thomsen[1], Jørgen Serup[1]

[1]*Bispebjerg University Hospital, Department of Dermatology, the "Tattoo Clinic" and Dep. of Patology; (Copenhagen, Denmark)*.

**Aim**: Most chronic tattoo reactions occur in red tattoos or in nuances of red. An allergic mechanism elicited by red pigment composed of various azo-chemicals is suspected. The aim of the study was to assess and grade epidermal and dermal changes of such tattoo reactions including immunochemistry relevant for the study of a possible allergic pathomechanism.

**Methods**: Skin biopsies taken from red tattoo reactions were assessed and graded by conventional microscopy and stained for T and B-lymphocytes, Langerhans cells, macrophages and TNF-α.

**Results**: The study included 19 biopsies from 19 patients. The culprit colours were red/pink (n=15) and purple/bordeaux (n=4). Every biopsy showed dermal inflammation with lymphocytic infiltration (in 100%), especially in the papillary dermis immediately under the basement membrane zone, where it was obligatory. Fully developed Interface dermatitis concentrated around the basement membrane zone was the lead pathology pattern found in 78% of samples. Overlap with granulomatous (in 32%) and pseudolymphomatous reaction patterns (in 32%) was noted, and these patterns were inconsistent and might coincide in the same biopsy. Epidermal hyperkeratosis (in 89%) was common. Leakage of red pigment across the normally tight dermo-epidermal junction with pigment escaped from the outer dermis into the epidermis was noteworthy (in 28%). Pigment escape was interpreted as a consequence of interface damage with barrier defect created by the interface dermatitis and caused by the pigment in the outer dermis. Epidermal hyperplasia was interpreted as reactive. The dermal cellular infiltration was dominated by T¬-lymphocytes (in 100%) and dense infiltration with Langerhans cells (in 95%) and macrophages (in 100%). TNF-α was common.

**Conclusions**: Inflammation of red tattoo reactions is concentrated in the papillary dermis, where cellular infiltration with lymphocytes is obligatory. The predominant histological pattern of reactions is interface dermatitis, which may be associated with interface damage and escape of red tattoo pigment into the epidermis. Granulomatous and pseudolymphomatous patterns are inconsistent and overlap and coincide. T-lymphocytes and Langerhans cells are dominating supporting the view that allergy is the typical pathomechanism behind reactions of red tattoos. TNF-α may contribute to reactions as a mediator of inflammation.

# 13

## PSEUDOLYMPHOMATOUS TATTOO REACTIONS

**Enzo Berardesca**[1], Marco Ardigo[1], Luca Muscardin[1], Norma Cameli[1]

[1]*San Gallicano Dermatological Institute; (Rome, Italy)*.

Many skin reactions can occur after tattooing, mainly related to the reactive inflammation induced by ink injected into the skin. Reactions can be allergic (characterized by skin sensitization to the color), granulomatous, lichenoid or pseudolimphomatous. These are tattoo reactions that mimic B-cell or T-cell lymphomas. Infiltrates can be mixed with T and B cells with variable populations of eosinophils and plasma cells We describe 3 cases after injection of red ink, and present an overview of the literature. Reflectance confocal microscopy (RCM) can be a useful tool to monitor and follow up non invasively the inflammatory reaction in tattoos.

# 14

## TATTOO, PSYCHE AND PSYCHOPATHOLOGY

**Anna Zalewska-Janowska**[1]

[1]*Psychodermatology Dep., Chair of Clinical Immunology and Microbiology, Medical University of Lodz; (Lodz, Poland)*.

Tattoos were for decades regarded as marker of different psychopathologies and performed eagerly by drug addicts, prisoners and criminals. Literature data point out at higher levels of impulsiveness, adventurism, empathy, neuroticism, anxiety, dissatisfaction, low self-esteem etc.

However, nowadays tattoos become very popular among different society groups. Tattoos are considered not only as cosmetic skin adornment but also as a way of emotional expression.

**Aim**: The aim of our study was to evaluate different emotional aspects including emotional intelligence, control of emotional aspects including anger, anxiety and depressive symptoms with sense of self-efficacy in tattooed people.

**Methods**: We used the following questionnaires: INTE to evaluate emotional intelligence, Courtauld Emotional Control Scale (CECS), General Self-Efficacy Scale (GSES).

**Results**: Tattooed persons reported that in 78.1% personality expression was strong motivation to acquire tattoo. We also observed that the stronger emotional intelligence the higher self-efficacy was observed. Self-efficacy also demonstrated positive correlations with appraisal and expression of emotions, regulation of emotions and utilization of emotions. We did not find any significant difference between emotional intelligence, emotions control and sense of self-efficacy depending on sex, age and tattoo number.

**Conclusions**: Our study indicates that relation between emotional intelligence and self-efficacy could be a proof of emotional intelligence importance in adaptive functioning. Broader multidisciplinary studies evaluating different psychological parameters in different groups of people acquiring tattoos out of different reasons seems to be of importance.

# 15

## QUALITY OF LIFE AND SUBJECTIVE COMPLAINTS OF TATTOO REACTIONS MEASURED BY DLQI AND THE ISS SCORE OF ITCH

**Katrina Hutton Carlsen**[1], Jørgen Serup[1]

[1]*Department of Dermatology, Bispebjerg University Hospital, the "Tattoo Clinic"; (Copenhagen, Denmark)*.

**Aim**: Tattoos are a trend with increasing side-effects. The burden of tattoo reactions was not studied in the past. We aimed to assess tattoo reactions and their influence on quality of life and itching by utilizing the Dermatology Life Quality Index (DLQI) scoring system and the Itch Severity Scale (ISS).

**Methods**: Patients attending the "Tattoo Clinic" at Bispebjerg University Hospital, Denmark with tattoo problems spanning more than three months were invited. 40 patients participated, during September-November 2012. Patients attending their routine consultations completed the ISS and DLQI questionnaires. Both scoring systems are validated.

**Results**: Patients with tattoo reactions experienced reduced quality of life, DLQI score 7.4, and were burdened by itch, ISS score 7.2. Both DLQI and ISS results attained the level of discomfort of known skin diseases such as pruritus, eczema and psoriasis. Even small tattoo reactions showed high scores.

**Conclusions**: Sufferers of tattoo reactions have reduced quality of life and are often burdened by itching attaining the level of other cumbersome afflictions recognized as dermatological diseases associated with itch. Tattoo reactions warrant diagnosis and treatment with same professional intent shared with other skin diseases.

# 16

## COSMETIC TATTOOS, WHO,WHY, WHERE AND WHEN? TECHNIQUE AND COMPLICATIONS

**Christha De Cuyper**[1].

[1]*Department of Dermatology, AZ Sint-Jan AV; (Brügge, Belgium)*.

Facial cosmetic tattoos, simulating make-up, have become very popular in the last decades. Blepharo pigmentation (permanent eyeliner), eyebrow tattoos and lip liner tattoos are common nowadays. The dyes used are relatively inert and usually well tolerated. The procedure causes little discomfort and complications are rare. However, side effects can occur; infection, allergic reactions, granuloma formation and scarring have been reported. The most common complications and patient dissatisfaction result from misapplication of the dyes, pigment migration and pigment fanning. Attempts to cover unwanted tattoos with flesh tones seldom give satisfactory cosmetic results. Lasers offer the best cosmetic result for removal of unwanted tattoos. However some flesh tone and red tattoos containing ferric oxide will change into black color when treated with laser.

# 17

## SAFETY IN TATTOING

**Rita Molinaro**[1]

[1]*Breast Unit Treviso Hospital; (Treviso, Italy)*.

Since 2008 the "Breast Unit" at the Treviso Hospital, Italy, is leading a pilot project with the aim of apply an innovative method of dermopigmentation in medical fields.

We have treated in addition to the breast: maxillofacial pathologies, connectively and skin grafts, Koebner syndrome, vitiligo, alopecia and alopecia after chemo-therapy, burn scars.

This innovative method is characterized by the following features:

- Multi-disciplinary approach
- Sterilization philosophy: sterilized outfit (autoclaveable tattoo machine), sterile working place, sterile pigments
- Special pigments

**Multi-disciplinary approach**: Breast Unit is a team of full trained specialists in breast cancer diagnosis and treatment

The core team is composed by Breast Surgeon, Plastic Surgeon, Breast Radiologists, Breast Oncologists, Radiotherapist, Breast Pathologists, Psychologist

The multi-disciplinary team drives the patient from the diagnosis to the tattoo.

For five years the specialist in medical tattoo is entered to make part of the multi-disciplinary team and collaborates actively with team specialists.

The specialist in medical tattoo shares with the other members of the team the right time for tattooing, hygienic sanitary protocols and management of possible complications.

**Philosophy of sterilization**: We have designed and patented:

- Sterilized working field including towels, plastic covers, color caps, shirts, clorexidina, demographic pencil with ruler, various caps, rubber bands, TNT patch, needles
- Autoclaveable tattoo gun: the first fully autoclave-sterilizable electronic machine, including motor, cable and hand piece

**Special pigments**: Single use, gamma radiated, produced with sterile water in certified clean room.

**Conclusion**: After 5 years working and more than 100 patients treated and monitored we did not register any complication.

Our tattoo applications do not interfere with diagnostic systems such as mammography or magnetic resonance.

High satisfaction of the patient, big savings in time for the operating rooms, big savings in time for the doctors (i.e. time for medication, follow-up, etc.), no convalescence.

It is important that the tattoo professional is trained and coached in a new and specific way. We are now dealing with ISS (Superior Italian Institute for Health) with the aim of creating specific rules and training path.

# 18

## LASER REMOVAL OF TATTOOS AND THE CHALLENGE OF TREATING TATTOOS WITH CHRONIC REACTIONS

**Agneta Troilius**[1]

[1]*Dep of Dermatology; (Malmö, Sweden)*.

Our laser department have removed cultural, cosmetic and traumatic tattoos since 1993 with mainly Q- switched Nd:YAG laser (1064 nm) and 532 nm for red colors. As for everyone else we have had problems with green, orange, purple and turquoise colors where we have needed other wavelengths. For traumatic tattoos softer material (e.g. gravel) have responded well with less amount of treatments 2-4 than for harder materials (e.g. asphalt, amalgam) 6-11 treatments. Camouflage vitiligo, to mask scars, and as an adjunct to reconstructive surgery. Risks and complications include infections, allergic reactions, scarring, fanning, fading, and dissatisfaction about color and shape. Developments leading to new tattoo inks (Infinit Ink), feedback systems to detect the absorbance characteristics of tattoo inks, dermal clearing agents, and perhaps even newer lasers with pico second pulse-duration might improve the result.

Although rare skin reactions in tattoos can cause great morbidity and cause a challenge for the physician. During a period of 9 years we only say 21 patients. Histology finding vary and can sometimes give hints of systemic reactions. Treatment often includes topical and systemic steroids, anti-histamin against the itch or anti-rheumatoid drugs. These treatment are not always successful and enough. Laser is often the preferable method, but little is known what happens to the colors when treated by laser. Cleavage products may present a hazard. Even risk for azo colors that may be cancerogenic. Surveying in case of severe allergic reaction is necessary. Professional tattoos contain a multitude of potentially immunogenic chemicals that are released or modified by laser treatment. Transient immuno reactivity that presented as regional lymphadenopathy after laser tattoo removal of professional black and blue-green tattoos has been reported. These reactions resolved without any complications. Tattoo pigments released or modified by laser therapy may trigger transient immuno reactivity in susceptible individuals. Surgical treatment of tattoos remains a useful tool for complete removal if possible and if there are allergies towards the ink. 16 malign melanoma has been reported in England in tattoos and 1 after laser.

Shall we go on and remove tattoos with laser?

# 19

## LASER TATTOO REMOVAL: A FEW TIPS & TRICKS

**Maurice Adatto**[1]

[1]*Skinpulse Derm & Laser Centre; (Geneva, Switzerland)*.

**Background & Objectives**: Tattoos have played an important role in human culture for thousands of years, and they remain popular today. The development of quality-switched (QS) lasers has revolutionized the removal of unwanted tattoos. The purpose of this study is to update the audience with the latest developments in laser tattoo removal and to give a few practical tips.

**Study Design / Material & Methods:** We have now 17-year experience and more than 1500 patients treated for tattoo removal and wrote several articles on this subject (1-2) During this talk we will develop the key points of our personal results and also introduce the new findings with the use of QS lasers, such as the new R20 method (3) and the use of picosecond laser (4)

**Results**: Some colors, like black, respond well to QS lasers, while some other like yellow do not respond at all. Some tricks while using QS lasers must be known, e.g. pigment darkening (5).

**Conclusion**: Laser tattoo removal is effective and safe if good patient and tattoo selection is made prior starting the treatment.

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# 20

## INTRODUCTION OF DERMATOME SHAVING OF TATTOO REACTIONS, RATIONALE, TECHNIQUE AND REACTIONS

**Bo Jørgensen**[1]

[1]*Dept. of Dermatology, Copenhagen Wound Healing Centre and the Tattoo Clinic, Bispebjerg University H; (Copenhagen, Denmark)*.

**Aim**: To present surgical ways to remove hazardous reactive pigments from human tattoos, in a manner who permits epithelialisation from the surface within fourteen days. And in the same procedure secure material for identification of the nature of the pigments.

**Methods**: Our technique is founded in the surgical wound healing: After excision of the ulcer, the defect is covered with a split skin. This spit skin, about 1 third millimeter of thickness, is harvested with a dermatome from an appropriate place at the body, the donor site. The different dermatomes can be adjusted for a deeper skin harvest or for necrectomy. This possibility is utilized in combination with a stage technique, when we step for step remove all visible reactive pigments. The intention is not to penetrate into the sub cutis by this surgical procedure.

The surgery is performed with highly aseptic technique and in infiltration anaesthesia. The dressing takes into consideration modern moist wound healing, and is left in situ for eight days. The patient is discharged from the Wound Healing Centre after a short period of observation for follow up in the Tattoo Clinic.

**Experience**: To day more than sixty procedures have been done at the Wound Healing Centre. Challenge has been the handling of the patients. Some are rather immature. The character of the reactive skin is different. Some are hard fibrous. Sometimes the pigment has been deposit very deep and near the sub cutis. Sometimes it is very difficult to distinguish red pigment from blood. The inflammatory reactions in the tissue can be so strong that it is difficult to cover the field with anaesthesia.

The preferred knifes are the classic Humphy-Watson dermatome and a special flexible short knife. Some experience is needed.

Other devices are in a test mode.

# 21

## DERMATOME SHAVING OF TATTOO REACTIONS, MEDICAL FOLLOW UP INCLUDING PATIENT'S SATISFACTION

**Mitra Sepehri**[1], Bo Jørgensen[1], Jørgen Serup[1]

[1]*Dep. of Dermatology, Wound Healing Center and the Tattoo Clinic, Bispebjerg University Hospital; (Copenhagen, Denmark)*.

**Aim**: To introduce and evaluate dermatome shaving of chronic tattoo reactions with respect to surgical technique, efficiency and potential sequels of surgery, including assessment of patient's satisfaction. Laser removal is relatively contraindicated since removal of tattoo pigment is likely to be incomplete and since photodegradation of pigment into hazardous chemicals and new or additional allergens may occur. Excision is limited to very small tattoos. Thus, there is a need for new surgical approaches for efficient clearing of dermal pigment from tattooed skin.

**Methods**: 50 consecutive patients with chronic tattoo reactions causing itch and discomfort were dermatome shaved to excise the culprit tattoo pigment from the outer dermis, where it is concentrated. On inclusion most patients had tried topical corticoids, which failed to be efficient. Medical follow up and a questionnaire interview was performed. The study started as an experimental approach and developed into a routine operation. Patients were included independent of the colour of the tattoo causing troubles.

**Results**: A marked decline in symptom and complaint rating was observed after shaving paralleled with high patient satisfaction. Seven patients required a second operation due to reoccurrence of the tattoo reaction at the margin of the shaved area. After change of practice with widening of the shave field slightly into the perilesional skin no reoccurrences occurred. Expected surgical sequels such as pigment variation and minor scarring of the shaved field were not noted as a problem by the patients, who prioritized being relieved from their itch and discomfort. 96% of cases needing operation suffered reactions in red tattoos deemed allergy to red azo pigment or to a hapten formed inside the outer dermis.

**Conclusion**: Dermatome shaving of chronic tattoo reactions with inflammation, skin thickening and possibly hyperkeratosis is efficient and with acceptable sequels. Patient satisfaction was high, and itch and discomfort was helped. Dermatome shaving can be recommended as fist line treatment of non infectious tattoo complications.

# 22

## PREOPERATIVE NON INVASIVE DEPTH DETECTION OF DERMAL INFILTRATION OF TATTOO REACTIONS BY HIGH-FREQUENCY ULTRASOUND SCANNING

**Jakob Tolstrup**[1], Katrina Hutton Carlsen[1], Jørgen Serup[1]

[1]*Bispebjerg University Hospital, Dept. of Dermatology, the "Tattoo Clinic"; (Copenhagen, Denmark)*.

**Aim**: The dermal depth of the pathology of tattoo reactions is a parameter when treatment with lasers or surgery is decided. We aimed to study this non-invasively and preoperatively with 20 MHz ultrasound.

**Methods**: In total 73 patients with adverse tattoo reactions were studied, using the Dermascan C 20Mhz ultrasound scanner of Cortex Technology, Denmark. In 58 patients scans could be compared to blinded histological rating of dept of infiltration by histology rated as 1, 2 and 3 representing infiltration of the outer, middle and deep dermis respectively.

**Results**: Mean thickness of reactions was 1.91 mm (SD 0.62) contra 1.18 mm (SD 0.27) in adjacent normal skin, $p<0.01$. Reactions consistently showed a sub-epidermal echo-lucent band. The thickness of this band correlated with skin thickening. Accordingly, the echo-density (measured as 0-30 low-echogenic band) of the outer dermis of reactions was reduced versus normal skin, explained by inflammatory edema. Pathologist's rating of level of cellular infiltration correlated with the thickness of the echo-lucent band by ultrasound.

**Conclusions**: 20 MHz ultrasound scanning is important in the preoperative diagnostic assessment of tattoo reactions, displaying the undisturbed micro-anatomical structure of the entire dermis and measuring the depth and invasion of tattoo reactions accordant with histology. Ultrasound should be used preoperatively in the routine to guide treatment by lasers, surgery and other treatment modalities.

# 23

## TATTOOING AND INFECTION: TATTOO INK IS A VECTOR FOR INTERNATIONAL SPREAD OF SERIOUS INFECTIONS

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**Aim**: To study the microbial safety of tattoo ink stock products and inks as a potential source of infection locally and across national borders. To discuss sterility and preservation requirements and future strategies to prevent infections in tattoos.

**Methods**: Clinical examples of common infections in tattoos are presented with a brief review of the issue. 58 new and unopened tattoo ink stock products from 13 manufacturers were purchased. These were cultured for bacteria and fungi pathogenic to humans. Labelling was checked as was damage to the bottles during transportation. Product data sheets were requested from manufacturers.

**Results**: 10% (6/58) of new inks were contaminated with bacteria, no with fungi. The isolates were Staphylococcus sp., Streptococcus sp., Pseudomonas sp., Enterococcus faecium and environmental contaminants. No Mycobacteria were found. 42% (5/13) of manufacturers claimed sterility. 12.5% (3/24) of inks claimed sterile was contaminated with bacteria. The physical sealing of bottles upon reception was not intact in 28% (16/58). On request of information about method of sterilisation and preservation 2 of 13 manufacturers responded and claimed their products were sterilised by gamma irradiation.

**Conclusion**: Tattoo ink stock products are often contaminated with bacteria, which are human pathogens. Claim of sterility is not to rely upon. Fortunately this exposure of the tattooed appears not paralleled with high rates of infected tattoos. Risk of infection transferred from tattoo ink, nevertheless, represents a serious risk. This threat calls for safer products and national surveillance strategies and control. It was hitherto neglected that tattoo inks potentially may spread serious infections such as penicillin resistant Staphylococci (MRSA) and Coli type VETEC across borders and internationally from bulk production sites. In a number of countries the frequency of MRSA is in the magnitude of order of 50% based on common isolates. The reservoir of MRSA is unlimited in a number of countries, where inks are produced.

# 24

## MICROBIOLOGICAL QUALITY AND PRODUCT LABELLING OF TATTOO INKS

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**Aim**: The purpose of the study was to examine the microbial product safety of unopened and opened tattoo ink in bottles and instruments (needles, spikes and grips). Packaging and labeling were also evaluated.

**Methods**: Physical inspection and microbiological analysis for bacteria and fungi were performed. Non-selective cultural media were used and incubation at 30°C. Identification of the bacterial species was carried out with the Vitek System.

**Results**: Only three of 34 inks were not contaminated. The 86% of the unopened ink bottles were contaminated. Different bacterial species were detected and the concentration range (1 ÷ >1000 CFU/ml) was very wide. Moulds were detected in much lower concentrations than bacteria. Some of the isolated bacteria were opportunistic pathogens and other species had a strictly environmental origin. All the instruments, labeled as "Sterilized" were not contaminated. On the label, all the products claimed sterility, had the brand name, the content and the expirer date. On nine bottles, the Period after Opening (PaO) was also reported. Each ink had its own Safety Data Sheet.

**Conclusions**: The European Council resolutions on tattoo ink introduce sterility and preservation of inks to protect customers. Nevertheless, the condition of sterility seems to be very difficult to maintain also in the unopened sterilized ink bottles. This can represent an additional risk for customers.

# 25

## CUTANEOUS INOCULATION OF NONTUBERCULOUS MYCOBACTERIA DURING PROFESSIONAL TATTOOING

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Nontuberculous Mycobacterias (NTM), in particular M. chelonae, have been recognized responsible of outbreak after tattooing process. We report 2 cases illustrating the need for enhanced due diligence measures in addition to existing strict legislation concerning tattooing.

**Observations:**

Case 1: a 29 year-old breast-feeding woman, consulted for a rash on a tattoo she received 2 weeks before, which worsened after a second session. More than 100 small erythematous papules were observed on the tattoo area, restricted to the diluted black ink (gray wash) area and the red-figures, beforehand spotted by diluted black ink. Histopathological examination and culture of a biopsy specimen confirmed the presence of M. chelonae. Spontaneous recovery was observed.

Case 2: a 23 year-old man consulted with a rash localized on the diluted black ink area that appeared 1 week after the tattoo session. Histopathological examination of a biopsy specimen suspected the presence of Mycobacteria (Zielh +). Culture was negative. A one-month treatment with chlarythromycine failed. A culture of a second biopsy specimen was still negative. Then the patient healed spontaneously about 6 weeks after tattooing.

**Discussion**: Those cases are interesting because they occurred despite the local regulation for tattooist to be trained in hygiene and asepsis. In the first case, we brought to light the fact that the tattooist didn't apply the rules of his office, using a bottle of water already opened for the dilution instead of a single dose boule of sterile water. Thus, we didn't observed any contamination of sealed-stock bottles (of black ink) as it was suspected in a recent epidemic in the USA. Here, the contamination source was probably the bottle of non sterile water used to dilute black ink, as classically described.

**Conclusion**: Because of the expansion of ornamental tattoo practice, it seems important to remind tattooists about use of single dose of sterile water to dilute the ink, to prevent those events. It seems also careful to prevent pregnant or breast feeding women from tattooing.

# 26

## RARE INFECTIONS IN TATTOOS

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Tattooing is over 6000 years old and has nowadays become a widespread and common practice. Yet, a number of complications can occur as a result of the procedure. Among them are infections, of which mainly the rare ones will be discussed. Piercing the skin with a needle creates a portal of entry for micro-organisms. These can originate from the ink or additives, the device, the environment or the skin itself. Most common bacteria are Staphylococcus, Streptococcus and Pseudomonas, which can cause superficial infection but also cellulitis, sepsis or even spinal abcesses. Congenital heart diseases increase the risk for bacterial endocarditis. In traditional (Samoan) tattooing, necrotizing fasciitis has repeatedly been reported, mainly due to troublesome hygiene. MRSA is of concern as it is resistant to many antibiotics and the carriers are often asymptomatic. Mycobacteria such as M. tuberculosis and M. leprae can be transmitted as well, mostly reported in endemic regions with questionable hygiene. Cutaneous leishmaniasis can occur within tattoos in HIV+ patients. Immunosuppression prohibits proper elimination of leishmania and the latter have preference for macrophage-rich regions such as tattoos. Syphilis inoculation has been frequently reported in historic reports, firstly in 1853. Viral infections are transmissible as well, ranging from viral warts, mollusca contagiosa and herpes to the more severe hepatitis B, C and HIV. Although very rare, fungal infections do occur.

Infectious complications do not only form a threat to the customer, but also to the tattoo professional. Therefore, good awareness of the risks and measures to prevent them is essential, both by the industry supplying the materials, as for the customer and the tattoo professional, but also by the healthcare workers involved.

# 27

## HYGIENE AND PREVENTION OF INFECTIONS IN THE NETHERLANDS; EFFECT OF REGULATION, CONTROL AND VIGILANCE

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In 2007 the Ministry of Health implemented uniform regulations that apply to professionals that perform tattooing and permanent make-up. These regulations include hygiene guidelines that are developed by the National Institute for Public Health and the Environment in cooperation with representatives of the tattooing associations. The guidelines contain a list of requirements including studio interior (for example location of hand-washing facility), cleanness of the studio, safe use of permitted equipment and products, sterilization methods.

A permit has to be applied for every three years to assure that practice complies with the national guidelines for hygiene ass well as with age-limits.

A permit may be granted after an inspection by the local health service, during which the act tattooing has to be performed. While a permit is due, the Food and Consumer Product Safety Authority may carry out unannounced inspections randomly or based on complaints.

Effect of regulation is measured intermittently. In an explorative survey 2011, 284 persons with one or more tattoos were questioned whether complications had appeared after placement. 0,4% of persons that had visited a licensed studio replied positive, compared to 16% of the persons that obtained their tattoo elsewhere. In additional research, infection was the main reported complication (43%). Although it has been suggested that tattooing and piercing are risk factors for HBV and HCV infections, a study in Amsterdam in 2011 found no evidence for an increased seroprevalence among persons with multiple tattoos. We suggest that uniform European hygiene guidelines would further contribute to safety of tattooing

# 28

## REVIEW OF TATTOO PIGMENT CHEMISTRY AND METABOLISM, IN SITU DEPOSITION IN SKIN AND SUGGESTED SYSTEMIC EXPOSURE

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Various tattoo inks are commercially available to stain the skin. An internet based survey revealed that most of tattoos are partially or complete black, followed by the use of red, blue, or green inks. Black inks frequently consist of soot products like Carbon Black or polycyclic aromatic hydrocarbons (PAH). The colored inks frequently contain azo pigments (red) or phthalocyanines (blue, green). Colorants in tattoo inks are manufactured for other intended uses and both, black and colored tattoo inks may not have an established history for safe use in humans. Specification of ingredients and labeling are lacking in many tattoo colorants, which are distributed by national wholesalers or through the internet.

Vibrating needles of tattoo machines puncture the tattoo inks into the skin. After that, part of the tattoo inks (e.g. Carbon Black, colored pigments, admixtures) stay in the dermis, is transported away from skin or is decomposed in skin by solar radiation during months and years. In addition, tattoo ink particles in the skin may be destroyed by intense laser radiation along with the effort to remove a tattoo from skin, whereas ink molecules can be decomposed. Thus, in addition to various tattoo ink ingredients, the human skin is exposed to radiation induced decomposition products. The injection of tattoo inks is hence a potential source for many adverse skin reactions, which were described in the medical literature during the past decades.

It is evident that tattoo inks, admixtures and decomposition products are transported away from skin to lymph nodes at least. However, it is almost unexplored so far, whether that transportation process might cause any systemic health problems in a long-term view. Toxicological and epidemiological studies are highly recommended.

# 29

## TATTOO INKS IN GENERAL USAGE CONTAIN NANOPARTICLES

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**Aim**: Tattoo inks are colorful products due to their content of pigments supposed to be particulate. Particle size of tattoo ink stock product was not measured systematically in the past.

**Methods**: In this study laser diffraction, electron microscopy and X-ray diffraction was carried out in order to study the size of the pigments dispersed in commercial tattoo inks available on the market. The dispersed pigments might have crucial effect on its surrounding and depending on the size of the pigments parameters such as; particle diffusion and reactivity play a crucial role in the physiology.

**Results**: From all investigated inks it was found that the pigments could be divided into three main classes. The black pigments were the smallest, the white pigments the largest and the colored pigments had a size in between the two. The vast majority of the tested tattoo inks contained significant amounts of nanoparticles except for the white pigments. The black pigments were almost pure Nano particles, i.e. particles with at least one dimension < 100 nm.

**Conclusions**: The findings of Nano particles in tattoo inks in general usage is new and may contribute to the understanding of tattoo ink kinetics. In general nanoparticles play an interesting role in the physiology. Due to its size there are not only risks but also possibilities, e.g. within drug delivery. Their sizes realize improved transportation thorough the body systems and due to their sizes there are increased surfaces, which imply more sites for reactions. For future aspects those findings need to be further explored in order to distinguish between healthy and non-healthy activities rising from Nano technologies.

# 30

## PARTICLES, ADDITIVES AND CONTAMINANTS OF TATTOO INKS: ANALYTICAL CHALLENGES

**Per Axel Clausen**[1]

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Tattoo inks are complex matrices composed of different substances and products that all add to the properties of the inks. In addition to the intentionally added substances and product are also contaminants contained in the ingredients of the ink. The fact that tattoo inks are not ideal solutions of pure compounds in a solvent but are rather a mixture of more or less miscible solids and liquids makes it a challenge to analyze in order to estimate the true composition of the inks. One of the problems is that analytical instruments usually require the mixtures to be studied in solution or that non-dissolved material can be separated from the dissolved. Another problem is that very polar or high molecular weight substances cannot be simultaneously analyzed with non-polar substances or substances of low molecular weight but often require a completely different instrument. The analytical challenges are similar to those encountered in analyzing surface modified nanoparticles for which we have developed a preliminary protocol. This protocol has been used to analyze the composition of organic compounds in 11 black tattoo inks (Høgsberg et al., 2013).

The ultrasonic extraction procedure for the tattoo inks was a modification of the method used by Regensburger et al. (2010). After methanol extraction the extracts were centrifuged at 20,000 g for 60 min in order to separate the carbon black pigment from the dissolved organics. One part of the supernatant was used directly for gas chromatography combined with mass spectrometry (GC-MS) analysis of lower molecular weight compounds and another part was used directly for matrix assisted laser desorption ionization mass spectrometry (MALDI-TOF-MS) to examine the content higher molecular weight, non-volatile, and polymeric compounds.

The extractable organic compounds from the investigated black tattoo inks showed a wide variety in types and concentrations. All organic compounds identified with MALDI-TOF-MS were non-ionic surfactants and included nonylphenol ethoxylates (Surfonic N-X), octylphenol ethoxylates (Triton X), heptylphenol propoxylates, alkenyl ethoxylates, mixture of polyethylene glycol, isosorbide oligomers and sorbitan ethoxylates (Tween), alcohol ethoxylates and 2,4,7,9-tetramethyl-5-decyne-4,7-diol ethoxylate (Surfynol 4XX). All the investigated tattoo inks consist of 2–3 main components in addition to the non-ionic surfactants and relatively high concentrations of PAH. The main components constitute 65–100% of the total extractable organic compounds analyzed with GC-MS and are all oxygenated compounds such as butanediol, glycerol and phenol.

Høgsberg T., Jacobsen N.R., Clausen P.A. and Serup J. (2013) Black tattoo inks induce reactive oxygen species production correlating with aggregation of pigment nanoparticles and product brand but not with the polycyclic aromatic hydrocarbon content. Experimental Dermatology 22, 464-469.

Regensburger J., Lehner K., Maisch T., Vasold R., Santarelli F., Engel E., Gollmer A., König B., Landthaler M. and Bäumler W. (2010) Tattoo inks contain polycyclic aromatic hydrocarbons that additionally generate deleterious singlet oxygen. Experimental Dermatology 19, e275-e281

# 31

## IDENTIFICATION OF PIGMENTS AND TATTOO INK INGREDIENTS BY PYROLYSIS-GAS CHROMATOGRAPHY-MASS SPECTROMETRY (Py-GC/MS)

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Identification of tattoo pigments is mainly carried out using liquid chromatography (LC) ultraviolet (UV) absorption spectroscopy, matrix-assisted laser desorption/ionization (MALDI) time-of-flight (TOF) mass spectrometry or Fourier transform infrared (FT-IR) spectroscopy.

Common disadvantages of these methods are either the need for pure pigments, insufficient solubility, the lack of reference substances for unambiguous identification of pigments or suitable spectra libraries.

Py-GC-MS provides a quick and reliable method for pigment decomposition product identification using either pure pigments or tattoo ink formulations. Here, we pyrolyzed pigments or tattoo inks at 800°C followed by gas chromatographic separation and electron impact ionization (EI) mass spectrometry. Identification of different pyrolysis products generated with this approach was carried out by using a common mass spectra library provided by the United Sates National Institute of Standards and Technology (NIST).

Since pigments decompose into defined patterns of products one can conclude the chemical structures of the respective mother compounds. For instance, the release of the potential carcinogenic aromatic amine 2-methoxyaniline from the azo pigment Yellow74 has been observed. Additionally, polymers used for pigment dispersion like polyvinylpyrolidones and polysiloxanes can simultaneously be identified.

Here, we provide pyrolysis data of tattoo inks of the main chemical classes of pigments that are widely applied in Germany and Europe. Using this approach, false declaration of tattoo pigments, suspicious additives and potentially carcinogenic aromatic amines as structural and releasable part of the respective pigment can be easily identified.

# 32

## ANALYSIS OF METALS IN TATTOO COLORANTS

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Legal limits for chemical substances require these to be linked to an analytical method. Neither ResAP(2008)1 nor the new Danish Law (in force on 1. January 2014) mention analytical methods for the analysis of metals in tattoo colorants and therefore there is neither a right nor a wrong method for the determination of the set limits. Failing to provide an appropriate method leads to unqualified and questionable results, often leading to legal disputes and leaving it up to a judge to decide which method should have been applied.

Most analytical methods consist of two parts: the work-up and the detection of the substances themselves. Results vary depending on the applied method and are mainly due to variations in the work-up.

A method being used by several authorities in certain parts of the EU involves microwave digestion as a work-up. This is a well known and established method especially in the food industry. The limits being used for the metals are taken from ResAP(2008)1. The reason for this is quite straightforward: there are no other documents with limits for metals in such products. The digestion method fails for several metals mentioned in ResAP(2008)1. One example: Barium. This is used in tattoo inks as barium sulphate, which is completely harmless. Therefore, it is used for X-rays as a barium meal containing much greater amounts of barium than are present in a kilo of tattoo ink. The basic problem with the microwave digestion method is the lack of differentiation.

In 2009 CTL® devised a work-up using extraction with an artificial perspiration solution and micro filtration. The CTL® method does not fail here.

The use of microwave digestion has led to withdrawal attempts by authorities due to tattoo colors exceeding the limits of ResAP(2008)1 for barium. Why this should be the correct method for tattoo colorants is unclear.

Irrespective of which is the correct method for detecting metals in tattoo inks, focus should be on the actual amounts in the skin. CTL® have conducted experiments to determine these and they are crucial for toxicological evaluation and for setting legal limits.

# 33

## ANALYSIS OF PAH, CHROMIUM AND NICKEL IN TATTOO INKS

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As official laboratory for competent authorities in Germany CVUA Karlsruhe analyses yearly risk orientated random samples of tattoo inks to ensure that they comply with the recommendations of the Resolution ResAP(2008)1 of the European Council. In 2012 and 2013 the surveillance program focused on the analysis of black tattoo inks in terms of carcinogenic Polycyclic Aromatic Hydrocarbons (PAH) and of colored tattoo inks in terms of nickel and chromium VI as strong sensitizers.

Pigment for black tattoo inks is Carbon Black as a material produced by the incomplete combustion of heavy petroleum products. Carbon black is considered possibly carcinogenic to humans and classified as a Group 2B carcinogen because of its content of impurities of PAH. Classification differs EPA-PAH and EFSA-PAH. With our method we analyze 21 substances by GC-MS. Sample preparation is done with ultrasonic bath and toluene as solvent. The determination of traces of nickel and total chromium (chromium III and chromium VI) is carried out via AAS after microwave-digestion at 200 degrees Celsius. If total chromium is above 5 ppm there is a specific determination of chromium VI by spectrophotometry after extraction in neutral milieu and derivatization with diphenylcarbazide to a diphenylcarbazon-complex.

In 2012/2013 two tattoo-inks contained Nickel in 12 mg/kg and 45 mg/kg. Those high concentrations were judged as serious risk cases. ResAP(2008)1 doesn't constitute limit values for nickel but Nickel should be "as low as technically achievable". In 2013 totally 36 samples were analyzed. Whereas four samples had amounts of 1-1.5 mg/kg, in most samples (32) nickel was below LoD (0.5 ppm). As a consequence 0.5 ppm may be considered as low as technically achievable.

Total-Chromium (Chromium III and Chromium VI) were analyzed in six samples in concentrations of 1.5 to 2 mg/kg. Most samples had amounts below LoD of 0.5 ppm Chromium.

The situation of PAH in black tattoo inks is more difficult. 8 of 35 samples were judged as serious risk cases to be published in RAPEX (i.e. amounts of Benzo-a-Pyrene (BaP) with 1500/1150/900/500 or 200 ppb).

# 34

## APPLICATION OF RAMAN SPECTROSCOPY AS A POTENTIAL FAST SCREENING TECHNIQUE OF TATTOO INKS AND REACTIONS IN SKIN BIOPSIES

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**Aim**: The purpose of this study was to evaluate whether Raman spectroscopy could be applied as a potential fast screening technique of problematic tattoos and inks; this in order to within minutes being able to non-invasively identify ink source(s) and possible pigment decomposition.

**Methods**: Shave cuts (biopsies) of tattooed areas from 13 persons, 10 inks and 3 primary aromatic amine (PAA's) standards were analyzed with Raman spectroscopy. A 785-nm 300 mW diode laser was used for Raman excitation and at least five spots were analyzed on each sample for evaluation of sample homogeneity.

**Results**: All ten inks and the three PAA's analyzed could be discriminated using Raman spectroscopy. Also 11/13 biopsies provided clear fingerprint Raman signals which differed significantly from skin background, and Raman spectra of 9/13 biopsies perfectly matched recorded database ink spectra.

Figure 1: Raman spectrum of biopsy (red) compared with spectrum of the ink "Tattoo" Red (black).

The red ink brand name "Tattoo" from an unidentified manufacturer labelling origin Taiwan as origin (or an ink with identical Raman spectrum) was with high probability identified in 5/13 biopsies and strong indications of the inks "Intenze Bright Red" and "Starbrite Grimson Red" were seen in other four biopsies. The 3 PAA's (aniline, o-anisidine and 3,3'-dichlorobenzidine) could not be identified in any of the analyzed biopsies.

**Conclusions**: Based on this study it is concluded, that Raman spectroscopy is a very promising technology for quick identification by fingerprint of tattoo ink in skin as well as in tattoo ink stock products. PAAs were not found in biopsies taken from tattoo reactions.

# 35

## TOWARDS MANUFACTURING OF HIGH-QUALITY INKS

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The original tattoo color, which mostly consisted of water, alcohol, glycerin and the chromophoric pigments, has no similarity with today's colors in the market

In accordance with rising quality requirements of the tattooists also the requirements on easy workable colors with high intensity rose.

But what are the criteria manufacturers uses in choosing which pigments, out of 4000, are applicable in a tattoo color and which are not?

Why is he manufacturer using Titanium dioxide and why can he not refrain from using it and how is the general structure of a tattoo color?

In the process of making a tattoo color the manufacturer not only faces challenges concerning impurities, which certain groups of Pigments have, but also has to comply with legal requirements.

But to what extend do this regulations make sense? And what would be an interesting and preferable future of producing safe tattoo inks?

# 36

## SURVEY ON SKIN CANCER ARISING IN TATTOOS AS REPORTED IN THE WORLD LITERATURE: INDUCED BY PIGMENT OR COINCIDENTAL?

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The introduction in the dermis of exogenous pigments and dyes to obtain a permanent design (tattooing) represents a unique in-vivo situation, where a large amount of metallic salts and organic dyes remain in the skin for the lifetime of the bearer. The potential local and systemic carcinogenic effects of tattoos and tattoo inks remain unclear. Several studies have shed light on the presence of potential carcinogenic or pro-carcinogenic products in tattoo inks. We extensively reviewed the literature and found approximately 50 cases of skin cancer on tattoos, mainly cases of squamous-cell carcinoma and keratoacanthoma, followed by cases of melanoma and basal-cell carcinoma. The number of skin cancers arising in tattoos is therefore seemingly low, and this association has to be considered thus far as coincidental. We will discuss the "classic" pros and cons argue for a potential carcinogenic risk of tattooing and tattoo inks.

# 37

## TOXICOLOGY OF NANOPARTICLES: ROS PRODUCTION, GENOTOXICITY AND MUTAGENICITY CAUSED BY CARBON BLACK

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Nanoparticles have shown many promising applications in medicine, science and technology due to size and behavior. Anything from drug delivery to strong lightweight materials are in the pipeline. However, smaller is not always better. Nanoparticles are often more reactive than large particles due to the higher surface area. Additionally they are more likely to translocate from the site of deposition, and thereby able to cause effects in multiple distant parts of the body.

The National Research Centre for the Working Environment conducts research on the effects of inhalation of Nano sized particles. One of the tested particles is a 99% pure Nano sized carbon black (CB; Printex 90, Evonik). Carbon black is used in major scale (>10 million metric tons/year) as a solid component in rubber, plastic, ink and paint industries (including black tattoo inks).

In an attempt to describe pulmonary toxicity and identify a possible mechanism of action for CB, we have performed a range of in vitro and in vivo experiments. I will show that CB, Printex 90 cause in vitro genotoxicity and mutations. And that detailed characterization lead to identify reactive oxygen species (ROS) as a likely mode of action. This hypothesis was supported by a mutation spectrum analysis showing increased G:C to T:A, G:C to C:G, and A:T to T:A mutations, in keeping with a genetic finger print of ROS production. This result substantiates the hypothesis of the mechanism of action. Also it underlines the importance of previous and new data showing that CB also induces strand breaks in BAL cells, lung parenchyma and liver tissue following pulmonary exposure in mice animals.

I will try to relate these results to possible effects in dermis/proximal lymph nodes following tattoos, and include possible outcomes if PAH rich CB is used, as well as give suggestions on possible future research in the area.

# 38

## AROMATIC AMINES IN TATTOO INKS: SURVEILLANCE ACTIVITIES IN ITALY

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In the last five years Italian authorities have promoted a program of chemical evaluation for the safety of tattoos and permanent make-up.

Local public health authorities and agencies for environmental protection have defined a protocol for the inspections of tattoo laboratories including sampling criteria of products used for tattoos.

The analytical results of aromatic amines determination are included for about 200 products of various brands of tattoo and make-up inks.

The list of amines detected is referred to the Resolution ResAP(2008), and the analytical method is "UNI EN ISO 17234:2010", applied for leather products and compared with the method described in Resolution ResAP (2008).

In a significant portion of samples analyzed aromatic amines were determined; most of these samples are related to the products of red and yellow colors.

A variability of results has been observed depending from the lot of production, with several positive samples not confirmed on different lots.

Retesting of products from the same batches showed also evidence of false labeling, with important difference of aromatic amines concentration in the samples.

The Italian Ministry of Health aims to promote an in-depth study based on the following priorities:

- extension of the statistical basis of samples
- increase in the range of analytical parameters
- update the database system products
- active involvement of producers, distributors and tattoo artists in the process of products improvement for prevention and health.

# 39

## POSITIVE OR NEGATIVE LISTS FOR ORGANIC PIGMENTS IN TATTOO INKS AND THE CONTRIBUTION OF ANALYTICS TOWARDS AN IMPROVED LEGISLATION

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Organic pigments are the main components of tattoo inks but the legal restrictions for tattoo inks are still based on restrictions for cosmetics, toys and textiles.

The lack of a positive list and the adoption of pigment bans from the cosmetics regulation led to an increasing occurrence of inks containing non-restricted pigments (56% of 190 investigated inks in the year 2011) which never were tested for usage in contact with the human body. For instance, such strange effects as the substitution of the quinacridone pigments C.I. 73900 and C.I. 73915 by their chlorinated congener C.I. 73907 were observed.

Toxicological data are desperately needed to establish a list of safe tattoo pigments but from today's perspective it is very unlikely that such data will be available in the near future. At the moment, it seems more promising to improve consumer safety by using analytical investigations to identify those pigments that might pose a health problem by releasing CMR substances.

For years, analytical measurements have been used to ban azo colorants that are thought to split off enzymatically into carcinogenic aromatic amines. Unfortunately, due to its design for soluble textile dyes, the method has its limitations for insoluble tattoo pigments. As an example, 3,3'-dichlorobenzidine based diarylide pigments often give negative results. Furthermore, reduction by azo reductases is only one possible degradation pathway for tattoo inks and only one group of CMR substances is addressed.

Several groups have shown the degradation of tattoo pigments under sunlight and laser irradiation. We have investigated many commercial tattoo inks with a wide variety of pigments for their stability under sunlight and laser irradiation and observed big differences in their stability. Especially azo pigments degrade easily under sunlight and laser irradiation and release a vast amount of breakdown products. Typical degradation pathways and several reaction products were identified but much more work has to be put into the identification of the products as well as in the design of a representative experimental design.

In any case, the negative list based on restricted pigments for cosmetics should be revisited and results of analytical investigations should be used to amend the existing negative lists in order to improve the safety of tattoo inks.

# 40

## HEALTH EFFECT ASSESSMENT OF CHEMICAL SUBSTANCES IN TATTOO INK

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**Aim**: In relation to tattooing, the health effect assessment is an assessment of whether a given chemical substance deposited in the skin is associated with a health risk. The aim was to evaluate whether specific chemical substances identified in tattoo inks on the Danish market pose a health risk for tattooed individuals.

**Methods**: Twenty-one chemical substances / substance groups identified in tattoo inks on the Danish market were selected for the health effect assessment. The health effect assessment consists of a hazard assessment, an exposure assessment and a risk characterization. The hazard assessment included an identification of the critical effect(s) in relation to tattooing and establishment of a 'No-Observed-Adverse-Effect-Level (NOAEL) for the critical effect(s). In the risk characterization, the exposure estimate is compared with the NOAEL for the critical effect(s).

**Results**: Limitations as well as lack of knowledge in relation to the exposure assessment for the selected chemical substances / substance groups, as well as in relation to the hazard assessment for a number of the selected substances, implied that a valid risk characterization could not be performed.

**Conclusions**: Based on the current knowledge, it could not be evaluated whether the selected chemical substances identified in tattoo inks on the Danish market would pose a health risk for tattooed individuals.

# 41

## TATTOO INKS FROM A REGULATORY TOXICOLOGY POINT OF VIEW: CHALLENGES AND POSSIBLE COURSE OF ACTION

**Annegret Blume**[1]

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Approaches to risk assessment of tattoo inks are at present not an easy task, because vital data are missing and concepts are only beginning to emerge. Compared to regulations in other areas like cosmetics or toys, regulation of tattoo inks needs to address specific features inherent to these substances and their use. To ensure that risk assessment and regulation are based on solid ground, some points need to be addressed, which will be discussed shortly in the presentation.

First, risk assessment is based on exposure to substances. Since individual persons` tattoos can vary considerably in size as well as in number, these variations have to be taken into account when evaluating the associated health risks.

A second point is the fact that for the testing of substances which are specifically applied under the skin, no validated OECD guidelines are available at present.

A third problem is the development of analytical methods (ISO standards) to measure potentially harmful substances in tattoo inks.

Another issue is the evaluation of pigments for a positive list, given the unmanageable multitude of pigments which could potentially be used in these inks. Here, a preselection process needs to be installed which narrows down the substances to be assessed from possibly a few hundred available pigments to about 15-20 which are sufficient to create all shades of color.

Last, the epidemiological basis to estimate tattoo-related complications is small. This means that surveillance or vigilance systems need to be developed (or existing systems to be amended for this specific group of products) which provide the data which are needed to assess whether putative risks are encountered in practice.

However, some risks as for example potential long term CMR effects of tattoo inks are difficult or impossible to assess directly; here, a structure analogues will have to be used. The generation of data on bio kinetics of tattoo inks is a vital point in this context.

# 42

## ALLERGY PATCH TESTING IN SUSPECTED ALLERGIC TATTOO REACTIONS

**Marléne Isaksson**[1]

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**Background**: Allergic reactions to tattoo inks seem very uncommon in spite of the high frequency of permanent tattoos. It is very difficult to find the incriminating substance if a contact allergy to the ink is suspected. Many tattoo inks contain azo dyes, some of which are allergenic. The most common organic ink sensitizers belong to the azo dyes, also used for coloring synthetic textile materials (e.g., polyester). Several investigations have demonstrated that commercial azo dyes contain impurities or intentionally added substances, which also are sensitizers.

**Aim**: To investigate the patch test results from 1995 up until 2013 at the department of Occupational and Environmental Dermatology in Malmö and how tattoo inks had been tested.

**Method**: Analysis of patch test results retrieved from DALUK, an electronic system for collecting patch test results..

**Results**: 18 patients had been patch tested with tattoo inks since 1995. Inks had been tested as is, at 50, 25, 10 and 1% in water or petrolatum. Only one patient had reacted to his black ink, tested as is.

**Conclusions**: Patch testing is almost always negative. It is mostly very difficult to get information on the composition of the inks and test with individual components.

# 43

## WHICH SUBSTANCE IS AN ACTUAL ALLERGEN IN AZO DYES?

**Laura Malinauskiene**[1,2], Erik Zimerson[2], Magnus Bruze[2], Kristina Ryberg[2,3], Marlene Isaksson[2]

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Allergic reactions to textile dyes are well documented. The most common dye sensitizers belong to the disperse azo dyes, which are used for coloring synthetic textile materials (e.g., polyester). Their use is limited in the European Union only in textiles which are labeled as ecological. Several investigations have demonstrated that commercial dyes contain impurities or intentionally added substances, which can be also allergens. Furthermore, in recent years it was demonstrated that human skin and bacteria on it are able to split azo dyes into the corresponding aromatic amines, some of which were sensitizers in the local lymph node assay. Simultaneous contact allergies to one of the most prevalent allergenic azo dye Disperse (D) Orange 1, 4-nitroaniline and p-aminodiphenylamine (PADPA) as well as to other disperse azo dyes and to p-phenylenediamine (PPD) have been reported. Cross-reactivity is one of the possible explanations but theoretically it is also possible that metabolites of the D Orange 1 are the primary sensitizers.

**Aim**: To investigate the sensitizing capacity of D Orange 1, PADPA and 4-nitroaniline, and the cross-reactivity between these substances and D Yellow 3, its potential metabolites from azo reduction (4-aminoacetanilide and 2-amino-p-cresol) and PPD.

**Method**: The guinea pig maximization test (GPMT).

**Results**: It was found that both D Orange 1 and PADPA are strong sensitizer and cross-react with each other. We were unable to sensitize guinea pigs with 4-nitroaniline tested in equimolar concentrations to D Orange 1.

**Conclusions**: The results indicate that patients sensitized primarily to D Orange 1 will react also to PADPA. PPD, 4-nitroaniline, 4-aminoacetanilide, 2-amino-p-cresol, and D Yellow 3, did not show any cross-reactivity to D Orange 1 or PADPA. 4-nitroaniline cannot be the primary sensitiser in case of sensitisation to D Orange 1. Whether the reactions to D Orange 1 show allergy to this substance per se, or due to its metabolites being the primary sensitisers could probably be elucidated testing these substances in equimolar concentrations and in serial dilutions at challenge in a GPMT.

# 44

## REVIEW OF EXPERIENCES FROM AZO TEXTILE DYES AND ALLERGY TESTING: THE CHALLENGE OF TESTING MULTIPLE INDUSTRIAL DYES OF LOW PURITY AND HIGH COMPLEXITY

**Ana M Giménez-Arnau**[1]

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Azo and anthraquinone dyes used to color fabrics are the most likely textile chemicals responsible of contact dermatitis. Both are the most common types of dyes used to tan mainly polyester and synthetic fibers. Azo dyes shows at least one azo group (-N=N-) as the chromophore. They may be derived from aminoazobenzene or from different heterocyclic structures. Based on its chemical properties belong to disperse, acid and reactive application class. Often textile dermatitis presents as eczematous dermatitis although, it can be misdiagnosed and the eruption becomes chronic, thickening and pigmenting the skin. Contact urticaria and pigmented purpura were also described. The accountability of a specific azo dye as responsible of contact dermatitis faces different problems e.g. mislabeling and purity. The allergenicity of dyes still requires studies to be fully validated. Until now is no compound or single mixture of compounds enough sensitive to be used as textile–dye allergy biomarker. The most widely used procedure for establishing textile dye contact allergy is to use of commercially available screening series or patch testing the own fabric. Para-phenylenediamine (PPD) and Disperse blue 106 were proposed as screening compounds to be included in the baseline series helping to detect azo-dye sensitization. Sousa –Basto with Azehna (1994) and Sertoli et al (1994) showed the usefulness of certain stable mixtures in the diagnosis of azo-dye contact dermatitis being well-tolerated and avoiding false-positive reactions. Actually, K Ryberg and M Bruze joint with the EECDRG studied the outcome of patch testing with a textile dye mix consisting of 8 disperse dyes at dermatology clinics in various countries. From 2907 consecutive patch tested patients a 1.6% showed a positive reaction to the textile dye mix, being simultaneous PPD positive reaction just in the 53% of these patients. Patients showing positive textile dye mix reacting to disperse Blue 106 and 124 seldom reacted with PPD. According with the results of this study, the inclusion of such textile dye mix in the baseline series will be recommended. The challenged diagnosis of azo-dye induced textile contact allergy will be reviewed through three clinical cases of severe contact eczematous dermatitis.

# 45

## HOW DOES THE ALLERGIC TATTOO REACTION REALLY LOOK, AND HOW TO TEST FOR ALLERGY

**Jørgen Serup**[1], Katrina Hutton Carlsen[1]

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**Aim**: "Allergy" essentially is a pathomechanism and not a phenomenology. Allergic reactions are hypersensitivity reactions mediated by the immune system following a period of sensitisation against an allergen such as a tattoo pigment. We aimed to study allergy patch test in tattoo reactions suspected to be allergic.

**Methods**: 90 patients with reactions which might be allergic were patch tested with batteries of 42 common allergens, 32 disperse dyes, 8 tattoo ink samples and individual culprit inks (n=25). 8 had cross reactivity in old tattoos of the same color as the reacting tattoo. Samples were applied under occlusion on the back for 48 hours, read after 2, 3 and 7 days. Punch biopsies of tattoos were taken for histology.

**Results**: 77 tattoos with reactions had been inked with red or red nuances. Tattoo reactions started 2 weeks to 5 years after the tattoo was made. Common allergens: 19 (21%) positive to nickel (related to other metal contacts such as piercing), 5 (6%) to cobalt, 0 to paraphenylenediamine PPD. Disperse dyes and tattoo ink series: negative with red "fingerprint" only. Culprit ink: 2 of 25 (8%) positive to red/purple, both patients suffering ulcero-necrotic tattoo reactions. Cross reacting patients: no special finding. Their biopsies were dominated by dermal inflammation which could be fiery, some cases with epidermal hyperplasia or granulomatous reactions.

**Conclusion**: Tattoo reactions including those with cross reactions being highly indicative of an allergic mechanism generally failed to react to allergy patch test with common allergens, disperse dyes, tattoo inks and their individual culprit inks. The allergen is unlikely to be directly present in the tattoo ink stock product, and the allergen apparently is formed inside the dermis through haptenization likely to involve tissue proteins. PPD was blank negative and there is no indication that primary aromatic amines, PAA, play a role. The sensitisation period is remarkably long. Some raw stuff especially originated or generated from industrial and impure red azo pigment must bare some role, but the nature and structure of such culprit(s) behind allergy of tattoos remain obscure. From cross reacting tattoos it became clear that, clinically, allergic tattoos are those with aggressive inflammation in any part of the tattoo inked with that problem color and with a period of weeks or months from tattooing to onset of reaction. Histology dominated by dermal inflammation under the dermo-epidermal interface may include epidermal hyperplasia and granulomatous reactions patterns. There is at the moment no test to recommend for preventive or diagnostic testing of tattoo inks or manifest allergy from tattoos, and there is no indication or specification of the raw material(s) in tattoo ink stock products, which especially in red inks is the primer of the much delayed development of allergic tattoo reactions.

# 46

## HENNA TATTOOS, PPD ALLERGY AND CROSS SENSITIZATION

**Jana Kazandjieva**[1]

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Para-phenylene diamine (PPD) is a well known allergen. Nevertheless it is widely used for the making of temporary henna tattoos. PPD is added to the henna paste in order to speed up the process of preparing and to intensify the color of the dye. Afterwards it is applied directly onto the skin. The risk of skin sensitization is due to the high concentrations of PPD, the long duration of skin contact, and the lack of a neutralizing agent.

We summarized 50 own cases with allergic reactions due to paint-on tattoos and try to outline the main characteristics for this special allergic contact dermatitis. In all cases PPD was confirmed to be the key factor for the development of allergic contact dermatitis. We found various interesting facts, concerning ethiology, incubation period, clinical picture and complications of the allergic contact dermatitis due to temporary henna tattoos.

Reactions to PPD observed in temporary tattoos are primarily delayed-type hypersensitivity (type IV) presenting as allergic contact dermatitis, lichenoid reactions and even erythema multiforme. Type I reactions have also been shown to occur. According to our opinion THT is hazardous for one's health.

# 47

## TATTOOING, "TOP-DOWN", "BUTTOM-UP" AND "MIX" REGULATORY STRATEGIES IN A GLOBAL SCENE

**Jørgen Serup**[1]

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**Aim**: Regulation of tattooing and manufacturing and distribution of tattoo ink stock products is chaotic and of highly variable ambition with many countries having no regulation. Even in Europe there are, ten years after the Council of Europe resolution introduced a standard for this region, no countries sharing identical rule. The regulatory prerequisites and instruments shall be analysed, and their limitations and inadequacies behind this general failure of function shall be discussed as an introduction to a panel discussion

**Methods and Results**: Regulations can be "top-down", i.e. the central authority decides rules followed by implementation, control and punishment, or it can be "bottom-up", i.e. the central authority avoids strict rules and put emphasis on watching the business with detection, isolation and treatment of problems coming up under real life conditions, with learning and prevention as outcome. Failure of one element of "top-down" invalidates the whole strategy, which obviously is vulnerable. "Top-down" appears high cost and generally not very realistic, "bottom-up" low cost and generally realistic.

The efficiency of "top-down", obviously, strongly depends on solid academic knowledge ranging from identification and quantification of the precise risk driver over the role of the driver(s) in tattooing, inks and the tattooist included, to the end point namely the existence of a significant health problem in real life, which elimination of the driver(s) can overcome or significantly influence. This depends on the success of implementation of all elements of the regulatory chain, and some level of acceptance by consumers, tattooists and ink manufacturers. Obviously, "top-down" is highly vulnerable at various levels. FDA of USA relies on "bottom-up".

Regulation of the tattoo business is facing huge obstacles namely that is anchored in tradition, some 100 million people are already tattooed in Europe, composition of inks is widely unknown and crude, and traditional toxicology fails to have valid models for prediction of risk specifically of tattoo inks. Many players are not registered or unknown. There are many backyarders and inks move freely across borders from production plants anywhere in the world.

There is a third model namely the "regulatory mix". In fields of special risk backed up by solid academic knowledge such as the obvious microbial risk of inks, a "top-down" strategy insisting on monodose and sterility would be rational and potentially efficient, while other fields of potential risk such as PAHs and PAAs in inks claimed carcinogenic but nevertheless not associated with any measurable increase of cancer in the tattooed population despite many years of use would call for intensified epidemiologic research and special surveillance.

**Conclusion**: The tattoo business is extremely difficult to regulate and the state of art of regulation is, ten years after the Council of Europe resolution of 2003, a regulatory chaos. There is a need for rethinking regulatory strategies, initiate research and decide instruments, which are rational, realistic and possible to implement in a large territory. Strategies may easily have to build on a "regulatory mix". It is in Europe with about 100 million people being tattooed a case for the European Union (EU).

# P1

## LOCAL ITCHING AND SWELLING THREE DAYS AFTER TATTOING WITH YELLOW AND GREEN COLORS IN A YOUNG WOMAN, KNOWN TO BE CONTACT ALLERGIC TO ALUMINIUM

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**Aim**: To highlight the risk of local contact dermatitis from aluminum in a tattoo, a case report.

**Method**: Observing an 18 years of age women seeking medical care three days after having tattooed a flower decoration on her right arm.

**Background**: At the age of 10 she had problems with itching and eczema on her upper left arm after vaccination and in her armpits, when using deodorants. A dermatologist referred her to a patch test clinic on the suspicion of contact allergy to aluminum. The patch test showed a strong reaction (+++) to aluminum chloride hexahydrate 2, 0 % in petrolatum.

Eight years later – on a Monday – she asked a tattoo parlor to make a four-colored decoration of her right arm. She asked them before if there were any aluminum in the tattoo and was reassured that this was not the case. The tattooing was done in black, red, yellow and green colors. On Thursday she had severe itching and swelling where there was yellow and green tattooing. She had no reaction at all where there were black or red colors. She was recommended local steroid application.

**Results**: The itching continued for around a year. The yellow color was analysed and contained 960 microgram aluminum per gram.

**Conclusions**: Individuals with an earlier subcutaneous itching nodule from vaccination could get long lasting contact dermatitis after a tattoo.

# P2

## CASE REPORT: LICHENOID REACTION IN A RED TATTOO AND CONTACT ALLERGY TO ALUMINIUM

**Ann Pontén**[1].

[1]*Occupational and Environmental Dermatology; (Malmö, SE).*

**Aim**: To investigate the possibility of contact allergy as the cause of an adverse reaction in a red tattoo in a 21-years old female patient.

**Methods**: Epicutaneous patch testing, histological investigation and atomic absorption spectrometry (AAS).

**Results**: The histological investigation showed a lichenoid reaction consistent with a contact allergic reaction. When patch tested, the patient reacted exclusively to aluminium chloride hexahydrate but negatively to the tattoo colour. Analysis of the colour with AAS showed 1.23% aluminium.

**Conclusions**: Persistent itching subcutaneous nodules and aluminium contact allergy have been described after vaccination with vaccines containing aluminium but are considered rare. Vaccines might contain 0.1 % aluminium. It was concluded that the adverse reaction to the red tattoo colour could be caused by contact allergy to aluminium. According to several reports, aluminium is comparatively often present in tattoo inks.

# P3

## LASER INDUCED CONTACTALLERGY IN A BLACK TATTOO

**Christa De Cuyper**[1].

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A 30-year old woman consulted for removal of professional black tattoos on both shoulders. Laser treatment was started with a 1064 Q-switched Nd-Yag laser with manifest bleaching of the tattoos. After 5 treatments she developed blistering within 24 hours after laser treatment; this was confirmed by repeating laser treatment on a small test area. Patch testing with the European standard series confirmed contact allergy to nickel sulphate. This was known by the patient since many years and not related to the tattooing. The black Rotring ink that had been used for tattooing was tested as such but did not react. Qs-Nd-Yag 1064 lasered Rotring ink however evoked a positive reaction within 24 hours persisting for nearly one week. Allergies to tattoo colorants have been reported and different clinical manifestations have been observed ranging from eczematous to lichenoid, granulomatous and pseudolymphomatous reactions, more in particular to red pigments. Localized but also generalised reactions to nickel in tattoo ink have also been described. Light (UV) induced itching and localised reactions in tattoos are documented. Laser induced allergic reactions however are very uncommon.

# P4

## STAPHYLOCOCCAL SCALDED SKIN SYNDROME (SSSS) PROCEEDED BY IMPETIGO IN A TATTOO ON THE FOREARM. A RARE BUT SERIOUS COMPLICATION

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**Aim**: To present a challenging case of an unusually aggressive bacterial infection causing adult SSSS in a patient proceeded by a tattoo with imported Chinese ink bought via the internet. Emphasize the lack of information, control and legislation of the potentially harmful elements and ingredients of the tattoo ink.

**Methods**: Case report and review of literature.

**Results**: 48-year-old man in previous good health developed signs of impetigo after a homemade tattoo on the left forearm in the same area with red and yellow secretions cultured positive for Staphylococcus Aureus (many colonies). A few days later he developed Nikolsky sign-positive tender enlarged flaccid bullae involving most parts of the body. The bullae ruptured easily and left an erythematous base. The temperature rose to 38,2 °C. Laboratory tests revealed an elevated C reactive protein of 22 mg/L [<10], leukocytosis 12.6 x 109/L [4.4-11] with neutrophilia. After he received a relevant antibiotic treatment of intravenous cefuroxime the clinical condition improved significantly, only for a short period. Then the patient developed another kind of exfoliative erythrodermia diagnosed as a systemic allergic reaction and was treated with high potency Prednisolone (40 mg daily)and later Cyclosporine (100 mg x 2 daily) with successful recovery.

**Conclusion**: Contaminated tattoo ink, especially imported from Asia, might pose a severe health-problem as illustrated in this case. We haven't found other cases of Adult SSSS due to possible contaminated ink in the literature.

We can imagine the scale of future problems when contaminated ink may contain methicillin resistance, MRSA.

# P5

## ASPERGILLUS FUMIGATUS CUTANEOUS INFECTION ON A HOME-MADE TATTOO

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Fungal and parasitic infections on tattoos are exceptional. They occur in case of lack of asepsis and hygiene during the procedure or the aftercare. We report the first case of primary cutaneous aspergillosis (PCA) in an immunocompetent patient after home-tattooing.

Case report: A 24 – year old healthy Finnish man was referred for a painful rash on a large black tattoo of the back that was performed at his home by a tattooist friend. A couple of weeks after, the tattoo was covered by painful purpuric necrotic papules and pustules evolving into crusts. He had no fever and physical examination was unremarkable otherwise. Laboratory tests disclosed hyperleucocytosis (20 800/mm3), elevated CRP (80 mg/mL) and hepatitis (ALAT 205 UI/mL). HIV, HBV, HCV, HSV and VZV infections were ruled out. Histology was non specific (acanthosis, dermal infiltration of lymphocytes and eosinophils). Periodic acid schiff and Giemsa staining were negative. Aspergillus fumigatus was isolated and identified in fungal cultures from the biopsy. Oral voricanozole was initiated in combination with local terbinafine and resulted in healing of the lesions 4 weeks after initiation of the treatment. Surgical revision of the necrotic tissue was performed. The tattooist vanished and neither material or ink could be recovered for analysis.

Discussion: Aspergillus is an ubiquitous saprophytic fungus that is common in soil, water and decaying vegetation. Inoculation may have occurred during the procedure (contaminated instruments or ink) or during the healing phase. Our case illustrates that severe and atypical infection may occur if tattooing is not performed with respect strict rules or hygiene and asepsis in a tattoo parlour. Backyard tattooists should be avoided.

# P6

## SPREAD OF GENITAL WARTS BY TATTOO NEEDLE INOCULATION

**Katrina Hutton Carlsen**[1], Jørgen Serup[1].

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**Aim**: Tattoos are increasingly popular among all age groups. In Denmark, 600.000 present tattoos in a population of 6 million people, approximately 13% of the adult population.

Viral skin infection and routes of transmission is described to enlighten a new dangerous route.

**Methods**: A 19-year-old Caucasian male, with a 12 years history of nephropathia and immune suppression presented genital condylomata accuminatum in our department of sexually transmitted diseases at the age of 16. Afterwards his first black tattoo on the right upper arm was performed in Germany (Fig.1) and another tattoo in black on the rest of the upper arm, stretching down towards his left hand with black lines and finally filled with black colour (Fig.2) performed in Denmark.

**Results**: One year later, he presented itching due to sun exposure and warts in the outlines of his tattoo (Fig.3), a biopsy was performed (Fig. 4) revealing viral infection, condylomata accuminatum, derived from his genital infection (Figure 5).

One might have expected the differential diagnosis Verrucae Vulgaris due to papilloma virus on his arm, (Figure 6) but this hypothesis was proven wrong.

**Conclusions**: The needle pricks of tattooing may infect and spread genital warts to other parts of the skin outside the genital area. Immunosuppressive treatment may predispose to this kind of event.

# P7

## PERMANENT MAKEUP AND RISK OF HERPES VIRUS INFECTION

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**Aim**: Lips are predisposed to herpes simplex virus (HSV). Some cosmeticians advice their clients to take oral acyclovir before and during lip tattooing, seemingly because the profession has experienced problem cases not reported or known in the medical community.

**Methods**: A 46-year-old woman with a 5-year-history of recurrent herpes labialis, usually provoked by throat infections, was admitted with a severe outbreak 2 days after having her lip lines tattooed with black-brown ink. Simultaneously, artificial eyebrows and eye lines were tattooed. Her medical history included no dermatological disease except for recurrent herpes. On this occasion she had no preceding throat infection or other symptoms.

**Results**: Typical herpes vesicles and crusts along the lip lines were seen. Also, the perioral skin was affected with marked swelling of the lips and the face including widespread redness. A few vesicles were noted in the glabella. Eyes were unaffected without any sign of keratitis.

Her general condition deteriorated with pain albeit without fever. Treatment was oral acyclovir with recovery in 4 weeks. The tattooed eyebrows and eye lines presented no herpetic eruption.

**Conclusions**: This severe attack of HSV, detected by real time PCR, was clearly provoked by lip tattooing, a risk not recognized generally; although, cosmeticians apparently are aware of it.

HSV may propagate systemically, with internal organ complications and disseminate in the skin into a widespread life-threatening infection known as eczema herpeticum/Kaposi's varicelliform eruption. Prophylactic treatment with acyclovir before tattooing of the lips is of utmost importance in persons having known risk factors.

# P8

## MASSIVE PSEUDOEPITHELIOMATOUS HYPERPLASIA IN A TATTOO. A RARE BUT SERIOUS COMPLICATION OR AN UNDERREPORTED AND UNREGULATED HEALTH HAZARD?

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**Aim**: To present a challenging case of an unusually aggressive hyperkeratotic tattoo reaction in a 42 year old caucasian female. Emphasize the lack of information, control and legislation of the potentially harmful elements and ingredients of the tattoo inks.

**Methods**: Case report and a literature overview.

**Results**: The patient was in previous good health, had a known food allergy to herring since childhood and contact allergy to zinc. The lesion was biopsied and due to a diagnosis of keratoacanthoma (ka), she was referred for excision and a split skin transplantation. She made an uneventful recovery and now bears an unsightly scar on her leg in rememberance of a failed decorative procedure.

**Conclusion**: To date only 7 cases of tattoo induced peh are reported in the english language literature with striking similarity, 4 occurred in the red "ink" as in this case and 2 in purple. They all occurred within the first months from initial application of the tattoo and initial diagnosis beiing made of a keratkacanthoma. The differential diagnosis of an infection, bacterial/mycobacterial, fungal or viral was rouled out. PEH bears a strong resemblance to squamous cell carcinoma and makes this an alarming and difficult diagnosis to make. Treatment varies but the symptoms are aborted only with mechanical removal of the tattoo.

# P9

## A CASE OF PSEUDOEPITHELIOMATOUS HYPERPLASIA TO TATTOOS

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**Aim**: The practice of tattooing has had over the centuries an evolution of its social meaning. The spread of these fads especially among adolescents makes an urgent need to provide for the health monitoring of the traders who engage in such practices, and to foster self-protection behaviors among young people. As a result of these practices may have local or systemic complications. The aim of this poster is the description of the case of a young woman presented to our clinic for a hyperplastic reaction in tattoo site on her posterior aspect of the left leg.

**Methods**: To make a correct diagnosis has been performed a complete clinical evaluation, Patch test series SIDAPA, Patch test for tattoo (FIRMA), cutaneous culture for microorganisms, and finally a cutaneous biopsy of the hyperplastic reaction located in the red area of tattoo.

**Results**: Patch test performed are all negative, such as the cutaneous cultures for microrganisms. Microscopically, has been described an intense chronic lympho-mononucleated perivascular infiltrate, associated with dermal sclerosis and red pigment-laden macrophages. The epidermal layer show acanthosis and orthokeratotic keratosis.

**Conclusions**: Therefore, a diagnosis of pseudoepitheliomatous hyperplasia was finally made. In literature there are few cases of PEH to tattoos but it is very important that clinicians be aware of this possibility and of the possible development of cutaneous cancer in the site of tattoo.

# P10

## MELANOMA ON TATTOOS: TWO CASES ILLUSTRATING POSSIBLE FORTUITOUS ASSOCIATION

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**Introduction**. The potential carcinogenic effects of tattoos and tattoo inks remain unclear. We report 2 cases of melanoma occurring on tattoos in Finnish patients.

**Case reports**.

Patient 1. In June 2006, a 61-yo male presented with an superficial spreading melanoma with nodular evolution (Breslow thickness 15 mm) on the right thigh overlying an old tattoo. Examination, full body CT scan and sentinel lymph node were normal. No relapse had occurred before 2009, after which no information was available.

Patient 2. In may 2012, a 32-yo male presented with a 1,3 cm non-ulcerated superficially spreading type melanoma (Breslow thickness 0,4 mm) on the upper back within a large black tattoo performed a couple of years earlier. A one-millimetre mole pre-existed before tattooing and gradually changed during the following years. The patient has been symptom-free for 6 months.

**Discussion**. Approximately 50 cases of skin cancers have been reported on tattoos, including 15 melanomas. The pathogenesis of a melanoma on a tattoo does not seem to differ from a melanoma on plain skin. Several studies have stressed the presence of potential carcinogenic or pro-carcinogenic products in tattoo inks. However, the prevalence of tattoos and melanoma increase in the population. Most of the reported melanomas developed on dark tattoos. Tattoos may play a role in melanoma growth, by masking the clinical malignant modifications and delaying the diagnosis, rather than by a true and direct carcinogenic effect.

**Conclusion**. The association between melanoma and tattooing remains fortuitous thus far. Tattoos can delay the clinical diagnosis of a melanoma.

# P11

## CLINICAL CLASSIFICATION OF TATTOO REACTIONS

**Jørgen Serup**[1].

[1]*Department of Dermatology, Bispebjerg University Hospital, the Tattoo Clinic; (Copenhagen, DK)*.

**Aim**: The diagnosis of tattoos and tattoo reactions according to the WHO classification of diseases is obscure and need accuracy. Tattoos and tattoo reactions are coded under the group Morbi pigmentationis cutis alia, code L81.8E with no further specification. Diagnosis of tattoo reactions in the clinic relies on local tradition and individual conclusion by the dermatologist. Often the conclusion from biopsy and histopathology is simply translated into a clinical diagnosis. Descriptive patterns such as "lichenoid", "granulomatous" and "pseudolymphomatous" are non specific and non discriminative, and may coincide in the same biopsy. There is a need for a rational diagnosis classification system, which primarily relies on clinical signs and symptoms.

**Methods**: Based on a large material and broad intake of patients with tattoo reactions and adverse effects as observed in the Tattoo Clinic since 2008, the patients (n approx. 350, October 2013) were grouped into those with complaints or complications, and the complications were divided into infectious and non infectious complications. The subgroups were further specified into a number of entities. Final classification of allergic reactions awaits the conclusion of supplementary studies, which shall define simple clinical criteria for allergic tattoo reactions.

**Results**: The major groups of non infectious events were represented by "plateau" (lichen alike), papulo-nodular, hyperkeratotic-exophytic, ulcero-necrotic, photosensitivity, intermittent (urticaria alike), pigment leakage and lymphopathy, neuro-sensory, generalised/systemic, and miscellaneous reaction patterns. Reactions supposed to be allergic in nature displayed three different reaction patterns and included autoimmunisation with affection of normal skin. Infectious events were specified according to their clinical presentation and aetiology. Examples are discussed. Figures are displayed in a photo gallery included in the poster session.

**Conclusion**: A new system for clinical diagnosis of tattoo reactions and events argued from clinical signs and symptoms and the suggested pathomechanism is under development. Such system may better guide therapeutic interventions described in a decision tree or algorithm. A final and validated version may be proposed for inclusion in of the WHO disease classification system. Universal diagnosis standard is essential for progress of international research on tattoos and tattoo reactions.

# P12

## CHRONIC TATTOO REACTION: PROPOSAL OF A MANAGEMENT ALGORITHM

**Nicolas Kluger**[1].

[1]*Departments of Dermatology, Allergology and Venereology, Institute of Clinical Medicine, University; (Helsinki, FI)*.

**Aim**: To propose a simple flowchart to help dermatologists and general practitioner in the decision making process from the diagnosis to the treatment of a patient presenting for the first time for a tattoo reaction.

**Methods**: Flow-chart was established based in the author's personnal experience of tattoo reactions and extensive review of the litterature.

**Results**: A "chronic tattoo reaction" was arbitrarily defined as a visible or palpable, asymptomatic, itchy or painful, skin reaction occurring within at least one colour or one part of one tattoo of a patient and lasting over 3 weeks to 1 month, irrespective of the delay of reaction after tattooing. Dermatologist shoud inquire about chronic dermatoses, diseases with potential skin involvement, reactions on previous tattoos and about similar cases in the tattoo shop. A proper clinical evaluation of the lesions is mandatory. A biopsy is usually unavoidable. Sarcoidal or foreign-body granulomas should prompt to look for sarcoidosis and a lichenoid infiltrate for lichen planus. A thickened epidermis can predict a poor response to local corticosteroid ointments by lack of penetration. Patch testing should be avoided because of lack of sensitivity/specificity and of impact in the therapeutic management. Therapies include corticosteroid ointments, corticosteroid infiltration, tacrolimus, Q-switched laser removal (under local treatment to prevent the exceptional "systemic" reactions) or surgery. The reaction may last until the culprit component is eliminated, therefore maintenance regimen could be necessary.

**Conclusion**: The following algorithm provides useful tools to allow a physician to have an adequate first line management of a chronic tattoo reaction.

# P13

## PERCEPTION OF TATTOOS AMONG PHYSICIANS: THE EXAMPLE OF ANESTHESIOLOGISTS, TATTOOS AND EPIDURAL ANALGESIA

**Nicolas Kluger**[1], Jean-Christian Sleth[2].

[1]*Departments of Dermatology, Allergology and Venereology, Institute of Clinical Medicine, University; (Helsinki, FI);* [2]*Service d'anesthésie-réanimation, Polyclinique Saint-Roch; (Montpellier, FR)*.

**Aim**: Tattoos are associated with negative perception and attitudes by non-tattooed individuals, including health care providers. We investigated whether anesthesiologist's perception of tattooing would interfere in performing an epidural analgesia (EA) through a lumbar tattoo of a parturient.

**Methods**: A prospective anonymous survey was sent to anaesthesiologists' including a clinical case scenario with a woman with a tattoo of the back covering totally the EA area. Questionnaire included whether they would perform an EA through the tattoo and their personal opinion regarding tattoos.

**Results**: 54 anesthesiologists (38 males, 16 females, mean age 47,6) completed the survey. 31 (57%) would perform an EA through the tattoo and 21 (39%) would not. Female anesthesiologists performed less EA in tattooed parturient women than male anesthesiologists ($p = 0,030$). Negative opinion towards tattoos was statistically associated with female gender ($p < 0.05$). We found a statistical difference ($p = 0,024$) between anesthesiologists who had positive opinion on tattoos and those who had negative opinion, as regards perform-ing an EA through a lumbar tattoo.

**Conclusion**: Having a positive or a negative opinion was related to the performance or no of an EA through a lumbar tattoo. Female anesthesiologists did have more often a negative opinion of tattoos compared to male colleagues and refused more often to perform EA to a parturient with lumbar tattoo. Personal perceptions of tattoos may influence directly the decision taking as regards performing EA among anesthesiologists. Our results need to be supported by larger series but raise the question to which extent tattoos influence the physician's perception and management of the patient.

# P14

## NANOSCALE ANALYSIS OF TATTOO INK IN VITRO USING ATOMIC FORCE MICROSCOPY (AFM)

**Colin Grant**[1], Peter Twigg[1], Richard Baker[2], Desmond Tobin[2].

[1]*Advanced Engineering Materials, School of Engineering, University of Bradford; (Bradford, GB);*
[2]*Centre for Skin Sciences, University of Bradford, Bradford; (Bradford, GB).*

**Aims**: Many appreciate the allure of intricate ink patterns drawn by skilful tattoo artists; however, clients are often not informed of the potential ramifications of having relatively untested pigment (nano)particles injected into their dermis. Here, using AFM we visualise ink particles in situ in normal human dermis, and after exposure to normal human dermal fibroblasts in vitro.

**Methods**: Tattooed arm skin was obtained with ethics approval from a 62y male, from which horizontal and vertical cryosections (5mm) were collected onto microscope slides. Tissue sections were transferred to a MFP-3D AFM (Asylum Research, USA) and imaged in air using Olympus AC160 silicon probes (tip radius ~10nm) in intermittent contact mode.

**Results**

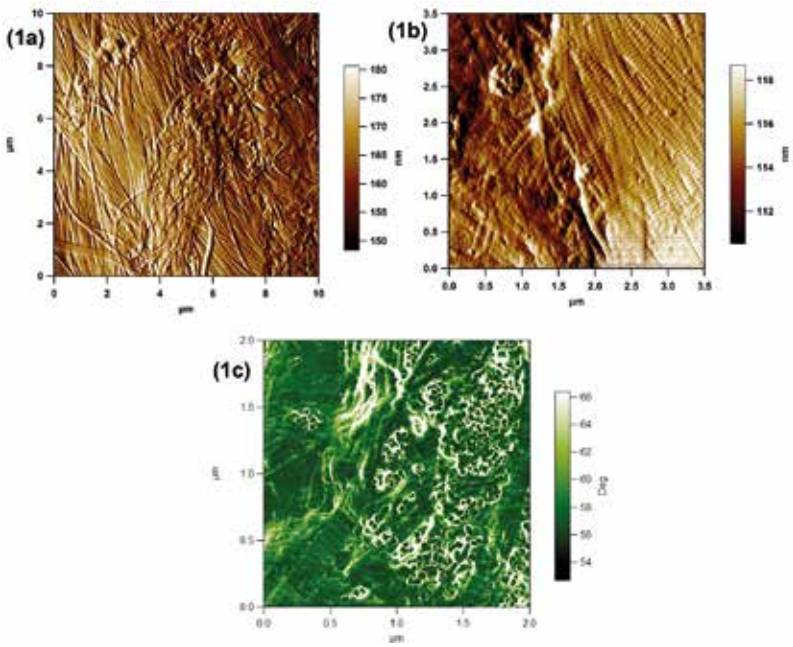



Figure 1a & b shows AFM amplitude images of disperse ink particles within the dermal collagen network. These figures demonstrate a strong orientation of the collagen fibrils, likely caused by the tattoo process.

Figure 1c shows a 2mm phase image, clearly resolving small ink particles.

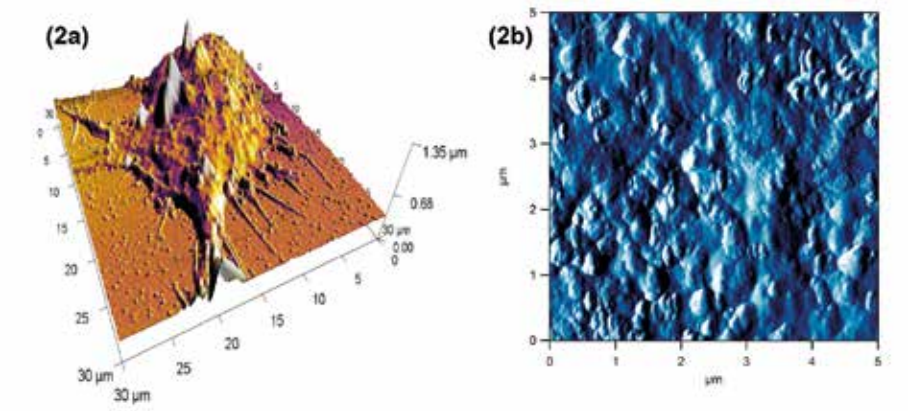



Figure 2a shows a 30mm scan of an individual fibroblast that has been incubated in dilute tattoo ink for 1 week. Figure 2b shows a close up of the fibroblast surface, showing ink particles on the surface.

**Conclusions**: AFM can resolve individual tattoo ink particles in skin tissue in situ and in association with individual fibroblasts in vitro and so may reveal potential interactions between ink (nano) particles and skin cells and tissues. Oriented collagen fibrils are also revealed from the tattooing process.

# P15

## TATTOO MATERIALS ON THE BELGIAN MARKET

**Davy D'hollander**[1], Christa De Cuyper[2], Sam Dekeyser[3].

[1]*TT*; *(Antwerp, BE);* [2]*AZ Sint Jan*; *(Brugge, BE);* [3]*UZ Ghent*; *(Ghent, BE)*.

A personal survey was done by D'hollander in 2006, concerning tattoo inks used in Belgium in body art parlours, checking the CI numbers from the list of ingredients of suppliers Mario Barth's Intenze, Starbrite, Diabolo Novum, Diabolo Classic, Micky Sharpz Traditional, Micky Sharpz Easyflow, Millennium Mom's.

Currently used colorants that can be obtained from suppliers on the Internet are labelled with a Colour index number (CI). The different CI numbers correspond to different chemical categories, with the same CI number used for different qualities of purity. Three different categories of purity exist according to cosmetics, food and medicine and are subject to EU regulations, respectively EU directive 76/768/EOF (cosmetics), EU directive 95/45/EC (food), EU directive 78/25/EC (medicine). The results of this survey are summarized. This survey also illustrates that a great deal of the colorants that can be purchased in an easy way did not respond to the requirements of cosmetics.

In 2008 The council of Europe has dealt with the safety issue of tattooing and PMU for years and adopted in 2003 the CoE Resolution on the regulation of tattooing/PMU products. Although tattoo inks are implanted intradermally it would have been reasonable to treat these products like medicine concerning their sterility and composition. However a more realistic approach has been chosen and the cosmetic approach submitting tattoo and PMU colorants to the requirements and safety assessments of cosmetics has been proposed. This resolution "follows a negative list approach by listing the substances which must not be used in tattooing products and PMU, based on current knowledge in this field," but also recommends "to regulate the use of substances in tattoos and PMU by taking steps towards establishing – on the basis of safety assessments carried out by competent bodies and harmonised at European level- an exhaustive list of substances proved safe for this use under certain conditions (positive list)." The resolution includes specifications about the content of the tattoo/PMU products, the labelling, the conditions of application and the obligation to inform the public and the consumer about the health risks of tattoos and PMU and tattooing practice.

A sample survey was repeated in 2013. The results demonstrate that the pigments considered safe are still the same (black, white, green, blue and brown), but the pigments most likely to cause problems, often based on azo-pigments (yellow, orange, red and magenta) show a shift, sometimes towards a more safe alternative, sometimes to an alternative with the same possible health risks.

It is my belief that the manufacturers try to find a more safe pigment within this color range, but have no choice but to use potentially hazardous pigments simply because

there is no alternative with good qualities for the purpose: insolubility, light fastness, color hue, etc.

The labeling on all sampled inks is according to the resolution. All sampled inks contain on the label a manufacturer, list of ingredients, batch or lot number, expiration date, mentioning of sterility. Only a few brands mention through the use of the cosmetics logo that the content must be used within a period after opening. A few bottles have mistakes in the list of ingredients (eg, CI 77226 instead of 77266 for a black ink).

The CI numbers on the ingredients list give a good indication towards the safety of the product, but it must be noted that this says nothing about the purity of the ingredient.

A 'safe' pigment like ironoxide can potentially be unsafe if the pigment used is of a technical quality which may contain heavy metals. Where as an 'unsafe' pigment can be of a medical quality, encapsulated in ABS making it inert and more biocompatible and as such 'safe' to use.

# P16

## SURVEILLANCE OF TATTOOING IN ITALY

Pietro Pistolese[1], Liliana Lasala[1], Mariano Alessi[1], Aurelia Fonda[1], Alberto Renzoni[2], Antonia Pirrera[2], Gianfranco Corgiat Loia[3], Raffaella Pastore[3], Marco Fontana[4], **Manuela Agnello**[4], Luca D'Ambrosio[5].

[1]*Ministry Of Health; (Rome, IT);* [2]*Istituto Superiore Di Sanita; (Rome, IT);* [3]*Regione Piemonte, regional public health autority; (Turin, IT);* [4]*ARPA Piemonte, Environmental Agency; (Turin, IT);* [5]*APPA Bolzano, Environmental Agency; (IT).*

In Italy EU Directive 2001/95/CEE was applied with D.Lgs "Codice del Consumo" n°206 of 2005. It is a law concerning the protection of consumers and users; this legislation guarantees the safety of all products placed on Italian market. This legislation has allowed in Italy the application of Resolution ReSAP (2008):1 (superseding Resolution ResAP(2003):2 on tattoos and permanent make-up) and the development of a surveillance system coordinated by the Ministry of Health.

In addiction, REACH Regulation n° 1907/2006 and CLP Regulation n°1272/2008 provide some restrictions for dangerous substances and specific rules for classification and labelling of substances, mixtures and articles.

The notification system RAPEX is the instrument used in EU for the information flow among local authorities, consumers, producers and users (tattooing laboratories). This system is currently used in Italy.

The surveillance activities in Italy is mainly conducted by:

- NAS (Nucleo AntiSofisticazioni – CARABINIERI), Ministry of HEALTH
- Regional Public Health Authorities (ASL, ARPA)

The analysis of samples is organized with a network composed by Istituto Superiore di Sanità (ISS) and Regional Public Laboratories specialized according to different analytical methods and chemical matrices.

The results of surveillance activities are published on Italian Ministry of Health website.

# P17

**SUN SAFETY INK!**

**Anne Laumann**[1], Robert Dellavalle[2], Barbara Walkosz[3].

[1]*Northwestern University Feinberg School of Medicine, Chicago*; *(Chicago, US);* [2]*University of Colorado School of Medicine and the Colorado School of Public Health*; *(Denver, US);* [3]*Klein Buendel, Inc*; *(Golden, US)*.

**Background**: Numbers of new melanomas, a lethal skin cancer, are increasing. Similarly, the rates of new basal cell carcinomas, the most common form of human cancer, are increasing. Data suggest that most of these cancers can be prevented by reducing unprotected sun exposure and avoidance of artificial ultraviolet light. The percentage of adults who report being sunburned at least once has increased. Although 60 -70% of adults say they protect from the sun, the use of protective measures has changed little.

Rates of receiving new tattoos are increasing, such that 21% of US adults have at least one tattoo. Tattoo artists often advise clients to protect newly applied tattoos from the sun.

**Aim**: To gather data on the potential of using tattoo artists and tattoo studios to promote full body comprehensive sun protection in order to prevent skin cancer.

**Methods**: Establishment of an expert advisory board of skin cancer experts and tattoo salon owners. Development of measures to assess sun safety practices and attitudes among the tattooed population using an on-line survey

**Results**: Excellent cross-fertilization of ideas between skin cancer experts, other researchers and tattoo salon owners, resulted in buy-in to the idea from the tattoo salon owners and operators and the formation of an easily understood survey about sun protection practices.

**Conclusions**: Based on the survey and other formative research, prototype materials will be developed and pilot testing implemented in two tattoo parlors in preparation for a more widespread randomized control trial for further evaluation.

# AUTHOR INDEX

ESTP research

European Society for Tattoo and Pigment Research

# STATUTES

## The European Society of Tattoo and Pigment Research (ESTP)

### 1. Name and place of business

The name of the association is the EUROPEAN SOCIETY OF TATTOO AND PIGMENT RESEARCH (hereinafter for convenience referred to as ESTP or the "Society".

The principal place of business of the Society shall be Copenhagen, Denmark.

The official language of the Society shall be English, and the Society is governed by the present version in English of the statutes, prevailing over any translations into other languages, which are for information only.

### 2. Objectives of the Society

To advance new and original medical, chemical, physical, toxicological, psychological, anthropological, social and other aspects of academic research on tattoos in man including any aspect of pigment and dye research. The fulfillment of the object shall be shared in a cooperation with researchers in any country or region of the world irrespective the primary geography of operations of the Society is Europe and the national states of this region

To deliver independent expert advice to public institutions and other parties who may request so. Moreover, to nominate academic experts, who in the name of the Society and under reference to the Society may serve in European, national and other expert groups or panels, including the European Union and its institutions and the European Council? Expert advice in the name of the Society can also be given to countries, institutions and parties outside Europe as it may be decided by the Society.

To educate the medical community and any other groups of professionals in diagnosis, treatment and prevention of adverse events, risks and hazards associated with tattoos and tattooing, and advance the medical diagnosis and treatment of complications of tattooing and tattoos and, moreover, pigments and dyes of all kinds in contact with or installed in the skin. Education also includes public education and education of tattooists and their customers.

To advance, nationally and across national borders the manufacturing, distribution and sales of safer or safe tattoo ink products as well as other coloring products prepared for the decoration of skin or in close contact with skin. These objectives also include the advancement of safer or safe ingredients, auxiliaries and other constituents of products as well as ensuring that tattoo ink products are without microbial contamination and bare no risk of infection of the person being tattooed.

To act as advocate of persons or patients who develop or potentially may develop complications or adverse reactions through tattooing. This advocacy accounts the general population as well as individual persons or groups under special risk.

To develop and support research projects, guidelines and publications of any kind and at any medium in advance of the objectives of the Society.

To purchase, take on lease or in exchange, hire or otherwise acquire in the name of the Society any real or personal property or any rights or privileges which the Society deems necessary or conductive to the promotion of its objects and

to maintain, alter or construct any building or structure necessary or convenient for the work of the Society.

To sell, lease, mortgage, dispose of or otherwise deal with all or any of the property or properties of the Society.

To employ such persons and retain the services of such persons, companies or corporations as are necessary to give effect to the object of the Society.

To carry out such other lawful activities as may be incidental to or conductive to the attainments of the objectives of the Society.

## 3. Non-profit making

The Society shall be a non-profit making organization. The society shall be independent of commercial and political interests.

## 4. Membership

All application for membership must be in writing and sent to the Secretary General or the Chairman who shall from time to time present membership applications to the Board for approval or rejection, and for the determination of the category to which the member will be assigned.

All applicants must agree to comply with the rules relating to membership as outlined in the bylaws of the Society from time to time.

The first 6 calendar months' membership is a qualifying period. During such qualifying period members are not entitled to rights which include ability to vote and to stand for any elections.

The number of members shall be unlimited. It cannot however at any time be less than three.

## 5. Categories of membership

The members of the Society shall be:

• *Ordinary members:* Any person who is a national of an eligible European country (eligible country at any time follows the decision of the Board) can be an Ordinary member of the Society.

This category of members is open to such eligible persons who accept the principles and the purpose of the ESTP and who are accepted by the board according to Art. 4 of the statutes.

Ordinary members shall be entitled to vote but are not eligible to be elected to the Board or to the Executive Committee.

• *Specialist members:* This category of membership is open to:

Physicians who are specialists in dermatology, in plastic- and reconstructive surgery or authorized in laser surgery, who are certified as specialists in Europe, and European nationals who are certified as specialist in the mentioned specialties in other countries.

Scientists holding a PhD degree or the equivalent in the mentioned clinical specialties and/or subjects related to the biology of the skin such as biology, chemistry, physics, sociology, psychology, anthropology, epidemiology and who are engaged in full time research in subjects relevant for the Society and its objectives.

Persons with outstanding or remarkable personal merits, backgrounds or contributions within the field of tattoo and pigment research, who are qualified across academic specialties as mentioned above or on their own grounds. This includes specialists from technical sciences.

Specialist members shall be entitled to vote and are eligible to be elected to the Board and as Officers of the Society.

• *Junior members:* This category of membership is open to clinicians or scientists (see above) in full specialist training or full time research (see above). Junior members shall pay a reduced fee and may apply for specialist membership, when they qualify.

Junior members shall be entitled to vote but may not be elected to the Board or elected as Officers of the Society.

• *International members:* This category of membership is open to:

Specialists in dermatology, specialists in plastic- and reconstructive surgery and specialists in laser surgery, who are certified as specialists outside Europe and of non European Nationality, and scientist holding a relevant PhD degree according to Art. 5B.

Physicians or scientists with special interest in tattoo and pigment research and of non European Nationality who otherwise would be eligible for Ordinary membership.

International members are entitled to vote and are not eligible to be elected to the board or as Officers of the Academy.

• *Supporting members:* Supporting members are organizations or institutions of any nationality, which are active in the field of tattoo and pigment research and share objectives with the ESTP.

Supporting members will include:

Research societies in the fields of medicine, biology, chemistry etc., i.e. fields relevant to the ESTP objectives, Art. 2.

Regulatory bodies and public institutions independent of country and region.

Corporate companies, Tattooist's organizations, Organizations representing Manufacturers and Distributors of inks and colorants, Consumer and Patient interests groups.

Supporting members shall not be entitled to vote and are not eligible to be elected members of the Board of Directors or as Officers of the Society.

• *Honorary members:* Honorary membership may be granted to distinguished persons who have performed particular meritorious research or services to the Society in fulfillment of the objectives of the Society.

Honorary members shall pay no subscription to the Society. Honorary members shall if of European Nationality be entitled to vote and are eligible to be elected to the Board or be appointed as Officer of the Society.

## 6. Suspension of membership

Annual membership fees must be credited to the Society for each calendar year by 31 May. Members whose fee payment is not credited to the Society are excluded from all rights of membership and from benefits. Members whose fee payment is credited to the Society after 31 May are again entitled to benefits from the credit date, and to member rights such as voting and standing for election from 1 January of the following year.

## 7. Termination of membership

A person shall ipso facto cease to be a member of the Academy with immediate effect upon the happening of any of the following events:

1) Upon death.
2) Upon resignation in writing to the Secretary General.
3) Upon expulsion pursuant to Statute 8 hereof.
4) Upon ceasing to qualify for one of the categories of membership of the Academy pursuant to Statute 5 hereof.

## 8. Expulsion from membership

A) Subject to Statute 8 (b) the Board, having received a complaint in writing against a member, may expel such member from the Society if in the opinion of a majority comprising not less than two thirds of the members voting in secret ballot shall deem such member to be an unfit or unsuitable member of the Society by reason or on account of his/her failure to observe any of the statutes of the Society or of his having acted or behaved or omitted to act or behave in any respect in a manner deemed to be detrimental to the interests of the profession or the Society or calculated to bring the Society into disrepute.

B) Such members shall be given not less than fourteen days' clear notice of such a meeting and shall be entitled to be present thereat in person and/or represented by their legal advisors and to a hearing at any such meeting.

C) Subject to the approval of not less than two thirds of the members of the Board voting at the meeting, a sanction less severe than expulsion (and to include suspension from membership for such period as may be thought fit) may be imposed.

D) A member to be expelled or otherwise dealt with in accordance with the foregoing provisions of this statute shall forfeit all claims to return of any monies paid by him to the Academy whether for annual membership fee or otherwise howsoever.

E) The Board if it so decides may request an ad hoc committee to examine the issues relating to the conduct of a member whose expulsion is being proposed and to report their findings to the Board prior to a vote being taken.

## 9. Membership fees

A) The membership fee for all categories of membership shall be determined by the Board from time to time and shall be paid at the beginning of each calendar year in a single payment credited to the Society by 31 May. The Board may grant a reduction in the

membership fee in exceptional cases and to special groups. If the membership fee is not timely credited suspension of membership is affected according to Art. 6.

B) It is at any time the obligation of Members irrespective of category of membership to keep the Society informed about their present electronic and postal address. Members carries the responsibility for loss of opportunity to fulfill any rights they have as Members of the Society if they cannot be approached via the electronic mail address they have reported to the Society

## 10. General meeting

A) The Academy shall in each one, two or three years hold an Annual General Meeting in addition to any other meetings in that year and shall specify the meeting as such in the Notices convening it. Not more than thirty-six months shall elapse between the date of one Annual General Meeting of the Academy and the date of the next.

B) The Annual General Meeting of the Society shall be held at such a time and at such a place as the Board shall appoint.

C) All General Meetings other than the Annual General Meeting shall be called Extraordinary General Meetings.

D) An Extraordinary General Meeting shall be convened by the Secretary General on receipt of a requisition in writing clearly outlining the purpose of the Extraordinary General Meeting from the Executive Committee or 50% (fifty per cent) plus one of the Board or 1/5 (one fifth) of the membership of the Society .

## 11. Notice of general meetings

Not less than six weeks notice shall be given of all General Meetings except in the case of emergency when the Board may convene an Extraordinary General Meeting on giving not less than fourteen days' notice. The notice shall be exclusive of the day on which it is served or deemed to be served and of the day for which it is given and shall specify the place, day, hour and agenda of the meeting and, in the case of special business, which shall include any matter that may require a resolution of the members of the Society, details of the general nature of that business and will be sent (together with all necessary accompanying documentation and voting papers) to each member.

## 12. Proceeding at general meetings

A) All business shall be deemed special that is transacted at an Extraordinary General Meeting and also all that is transacted at an Annual General meeting with the exception of the following matters which shall be deemed to be the ordinary business of the Annual General Meeting as follows:

1) The election of the Members of the Board.
2) The approval of any changes to these statutes.
3) The consideration of the reports of each of the Officers of the Society for the previous year.
4) The consideration of the report of the Board.
5) The consideration of the Society's plans for the following year(s).

B) 1) No business shall be transacted at any General Meeting unless a quorum of members is present at the time when the meeting proceeds to business.

2) No motion or resolution of the members shall be passed at any General Meeting unless the subject of such motion or resolution is noted in the agenda of the relevant General Meeting circulated in accordance with Article 11 hereof.

3) Any resolution of the members to be passed at any General Meeting shall be passed by a majority of the members voting at the relevant General Meeting.

4) Any Officer of the Society may be removed from office by means of a resolution passed by the members at any General Meeting provided that the Chairman or Secretary General has given the relevant Officer of the Society not less than fourteen days' clear notice of the fact that such a resolution shall be voted upon at the relevant General Meeting and that the relevant Officer of the Society is given the opportunity to address the members present at the relevant General Meeting before any vote is taken by such members.

5) A member shall not at any time vote on any matter relating to a contract, proposed contract or legal proceedings between the Society and himself/herself or his/her spouse or any of his/her ascendants or descendants in a direct line.

C) If within half an hour from the time appointed for the Meeting a quorum is not present, the Meeting shall stand adjourned to such other day and such other time and place as the Board may decide and if at the adjourned Meeting a quorum is not present within half an hour of the time appointed for the meeting, the members present shall constitute a quorum.

D) The Chairman of the Society shall preside at every General Meeting of the Society with all appropriate powers and privileges. If he is unable to attend, the General Secretary shall preside and if neither of them is able to attend the Chairman shall nominate an Officer of the Society to preside in their absence. The Chairman or his nominated replacement will, as presiding officer of the General Meeting, have a casting vote.

## 13. Votes of Members

A) Eligibility to vote:
Every Ordinary, Specialist, Junior, Honorary and International member in good standing has one vote.

B) Exclusion from voting:
No member shall be entitled to vote at any General Meeting unless his / her current annual membership fees and other sums payable by him to the Society shall have been paid in full by 31 May as specified in Art.6.

C) Validity of votes:
No objection shall be raised to the qualification of any voter except at the General Meeting or adjourned General Meeting at which the vote objected to is given or tendered. Every vote not disallowed at such General Meeting shall be valid for all purposes exercised at such General Meeting. Any such objection made in due time shall be referred to the Chairperson of the General Meeting whose decision shall be final and conclusive.

D) Procedure of voting:
Voting may be carried out personally, or by post or by electronic mail as detailed in the convening notice. The details of the relevant voting procedure shall be decided from time to time by the Board and will be outlined on the notice convening such meetings.

E) Administration of Elections:
Unless otherwise specified by the Board, the Secretary-General shall administer elections with the advice and assistance of the Officers of the Society and if relevant the Society's legal advisors or an ad hoc Election Committee as decided by the board.

## 14. Candidates for election

Only Specialist Members and Honorary Members of European Nationality are according to Art. 5 entitled to stand for election. All candidates going forward for election must be approved by the Board or a Nominating and Election Monitoring committee decided ad hoc by the Board. All candidates must agree to adhere to good code of conduct, complete the Conflict of Interest statement of the Society and adhere to any rules governing the behavior of candidates presenting for election as provided for in bye laws. Failure to do so may invalidate the candidature.

## 15. Board

The Society shall be administered by the Board which shall be composed of Specialist Members and European Honorary Members of the Society elected as follows:

1) The Board comprises up to 25 voting members and, if decided by the General Meeting 1-5 deputies.
2) Board members shall whenever possible represent the geography of Europe namely the Central, Nordic, Southern, Eastern and Western regions.
3) The General Meeting can on the proposal of the Board nominate up to 3 co-opted advisers or observers to the Board. Advisers shall contribute with their special expertise or represent organization or bodies the Society cooperates with, and they shall contribute to the fulfillment of the objectives of the Society. These have no vote and need not be members of the Society.

## 16. Elections to the Board

A) Voting members of the Society shall elect the Board Members by voting at the General Meeting in an election according to 13(d) and (e) above and subject to article 17 below.
B) The presiding officer has a casting vote.
C) The Chairman or his nominee is the presiding officer at all meetings of the Board.
D) The Board Members are elected for a period of six years and may be re-elected once.
E) The General Meeting can exceptionally decide to re-elect a Board member twice, the third period being 3 or 6 years.
F) The first General Meeting of the Society can decide to limit the active period of Board Members to three years, with re-elections according to 16(e).
G) Deputies, who shall be Specialist Members, are appointed for 3 years or as decided by the General Meeting.
H) Observers and advisers are nominated for a period of 3 years or as decided by the General Meeting.

## 17. Eligible European countries

The European Countries determining the priority of activity of the Society and defining the category of memberships shall be the countries recognized as being within the geographic boundaries of Europe by the European Union together with any other European Country situated at least partly within the geographic boundaries of Europe which has been accepted as an eligible European Country by the Board.

## 18. Powers, duties and procedures of the Board

A) 1) The business and management of the Society shall be subject to the approval of the Board which shall exercise all such powers of the Society as are not by these Statutes required to be exercised by the Society in General Meetings subject nevertheless to these Statutes and to such direction as may be given by the Society in General Meeting. No direction given by the Society in General Meeting shall invalidate any prior act of the Board which would have been valid if that direction had not been given.

2) The Board shall elect the following as the Officers of the Academy (hereinafter for convenience referred to as "the Officers of the Academy"), being
   a) The Chairman, or be titled President if so preferred
   b) The Secretary General, or be titled Co-Chairman if so preferred
   c) The Treasurer

   These elections shall be conducted by secret ballot of the members of the Board one Board Member request it so to be done.

B) The Board shall, from time to time, make bylaws and may alter or rescind any bylaws so made provided that no such bylaw may be altered or rescinded by a subsequent Board unless with the express consent of the majority of the members of such Board relating to the following:
   1) The manner of conducting the proceedings of meetings of the Board.
   2) The management and conduct of the business of the Society not specifically referred to the members of the Society in General Meetings.
   3) The management of all premises and property of the Society and the conduct of business and functions and any such premises and property.
   4) The duties of the Officers of the Academy.
   5) All such other bye laws as the Board feel are necessary for the proper running and management of the Academy in accordance with these Statutes.

C) The Board shall meet as often as the interests of the Society so require but at least once per annum. The meeting shall be convened in the following manner:
   1) At the direction of the Chairman
   2) At the direction of a majority of members of the Board

D) No business shall be transacted by the Board unless at least half the members of the Board are heard.
E) Unless expressly stated differently in these Statutes, all resolutions of the Board shall be passed by a majority of votes cast. If an equal number of votes are cast for and against any resolution, the Chairman or his nominated replacement shall have the casting vote.

F) The Secretary General shall keep the minutes of the Board meetings which shall be entered into a minute book having been signed by the Chairman and the Secretary General when agreed as a valid record by a vote of a majority of the Officers who attended the meeting in question.
G) The Board will have the authority to appoint and dismiss committees (and their chairpersons), who will report on their activities as required by invitation to the Board meetings (without voting rights thereat).
H) The Board may appoint an Administrator to assist in the day to day management of the activities of the academy. The administrator may attend the meetings of the Board and Executive Committee in an advisory role unless specifically requested not to attend by the Chairman, or a majority of the members of either of these bodies.
I) A Board member will be suspended or dismissed from office if suspended or dismissed from membership.
J) Electronic consultation and voting are acceptable procedures for all committees, the Executive Committee (hereafter called the EC) and the Board.

## 19. Powers, duties and procedures of the executive committee

A) The day to day management of the Academy is delegated by the Board to the EC, which shall be comprised of the following members:
   1) The Chairman of the Society
   2) The Secretary General of the Society
   3) The Treasurer of the Society
   4) One member of the Board elected by the Board from within their members. This member ideally is from a country or region which is not already represented on the Executive Committee by the Chairman, or the other Officers of the Society.
   5) The EC may be supplemented with 1-3 voting members if the board may so decide.
B) The EC may invite members of the Society (or others) to attend meetings or parts thereof in an advisory role without voting rights.
C) The Chairman or his nominated substitute will preside at all EC meetings and in the event of a tied vote shall have a casting vote.
D) All members of the EC shall be entitled to vote on all matters.
E) The Secretary General shall keep the minutes of all EC meetings which shall be entered into a minute book having been signed by the Chairman and the Secretary General and agreed as a valid record by a vote of the majority of the members who attended the EC meeting in question. The minutes of all EC meetings will be forwarded to the Board when approved.

## 20. Accounts

At the end of each financial year the Treasurer with the advice and guidance of the Society's accountant shall draw up the annual accounts for the expiring year and the budget for the following year for consideration by the Board, and ensure that the accounts of the Society are submitted timely to authorities as law may request.

## 21. Duration of office

A) The duration of office for the Chairman, the General Secretary and the Treasurer of the Society is 6 years. Officers of the EC are eligible to stand for re-election to their present position as to any office which they held any time before as long as they are elected Board Members holding the right to vote in the Board.
B) The General Meeting may at any time dismiss Officers of the Academy provided that this is on the agenda of the meeting; the Officer of the Academy in question has been given notice and has an opportunity to present their case, and a two thirds majority of members voting support the dismissal.
C) In the event of death, severe illness or incapacity of the Chairman, the General Secretary shall take over the function of Chairman. If this is required for longer than a 3 month period, then the term of office of the new Chairman shall be deemed to have started from the time that he took up the position of the previous Chairman.

## 22. Legal proceedings

Any two members of the Executive Committee acting jointly may represent the Academy in all dealings with third parties including legal proceedings.

## 23. Amendments to statutes

The Board voting by a majority of two thirds of its members, may propose changes to the Statutes. Such proposals shall after cross referencing be presented to the General Meeting for decision.

The Society in General Meeting by a majority of not less than two thirds of the members voting may extend, amend or appeal the Statutes for the time being in force. Voting will not be limited to eligible members physically present at the Extra Ordinary General Meeting but will include the option of electronic and / or postal voting .

A copy of every proposed amendment to the Statutes which is to be laid before the General Meeting of the Academy shall not less then six weeks before the date of the General Meeting be sent (together with all necessary accompanying documentation and voting papers) to each member of the Society electronically and/or via the ESTP website. It is at any time the duty of members to report their present electronic and postal address to the Society. Voting of the Society on amendments to the Statutes shall proceed if members with voting rights cannot be contacted. Amendments to the Statutes may either be accepted or rejected at the General Meeting but may not be altered or amended from the floor of the General Meeting.

## 24. Dissolution

In the event of dissolution of the Society, the members of the Society will be notified of the General Meeting convened for that purposes and be sent voting papers with this agenda item and shall, if necessary appoint liquidators, determine their powers and decide on the destination of the assets of the dissolved Society, following discharge of its liabilities.

## 25. General provisions

A 1) All functions performed within the Society by its Members and by the Members of the Board, of the Executive Committee and of other Committees will normally be discharged gratuitously and only out of pocket expenses can be reimbursed.

2) Upon rules of the Danish Tax Authority, a fee can be granted to the Members of the Board or of the Executive Committee or of other Committees in consideration of their particular activity for ESTP.

B) 1) In these statutes save where the contrary intention expressly appears, the masculine shall include the feminine the singular the plural and vice versa.

2) Reference in these statutes to “in writing” shall include notices and accompanying documentation sent electronically via email or other comparable technology, and, for the avoidance of doubt, Notices convening General Meetings of the Society and documentation required under these statutes to accompany such notices may be served electronically and where so served shall be deemed to have been received by the recipient Member on the date and time of sending unless a failure notice is received within twelve hours of the email being sent.

C) Members of the Society are responsible of the debts of the Academy only within the limit of the value of its social share of capital.

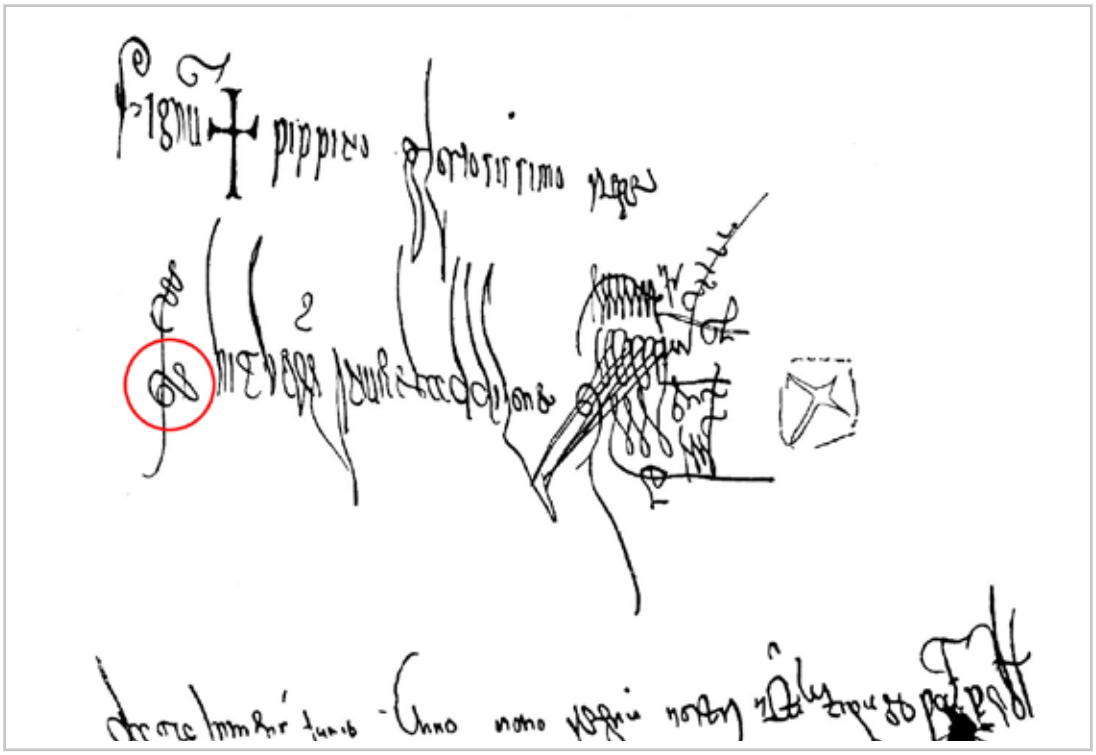
# THE CONGRESS LOGO

The essential element of the logo is an artistic free hand drawing encircled by a hexagon. The hexagon takes inspiration from chemistry and research, i.e. the aromatic benzene ring. The artistic drawing signals diversity of human life, freedom and joy attained on the premises of physical conditions provided by nature and understood though the study of natural sciences, in the logo symbolised and safeguarded by the hexagon. There may be many other readings of the logo dependent on the observer. The logo drawing resembles the G clef of music, which sets standard for lines and nodes from which music can be played on any instrument and throughout the world. There are actually many examples of G clefs, anchors and pieces of text tattooed on human skin as small drawings coming close to the chosen logo of the congress.

The ECTP also operates with an extended version of the logo including a text explaining the ECTP congress and its research mission.


The logo is copied from a document dating back to the middle ages namely a donation letter from 760 wherein Pippino (Pépin), King of the Franks donated a sum for the construction of a monastery in Fulda in appreciation of support extended to him by Pope Bonifatius in Rome, a manifestation of the alliance between physical and spiritual power. The Pope had anointed Pippino King of the Franks and consolidated his power and in reverse Pippino's army defeated the Longobards, who had invaded northern Italy and approached Rome and the Vatican. Fulda was located in the longobardian territory and seen as a catholic expansion. Pippino's son, Karl (742-814) also named Charlemagne or Carolus Magnus continued the alliance between King and Church, power and religion. He conquered most of central Europe and established an efficient system to control his empire. In the year 800 he was crowned in Rome as Emperor of Rome. It is hoped that the ECTP and the European Society of Tattoo and Pigment Research to become inaugurated at the ECTP in November 2013 despite the humble start nevertheless shall be successful in their endeavours, as Pippino was.

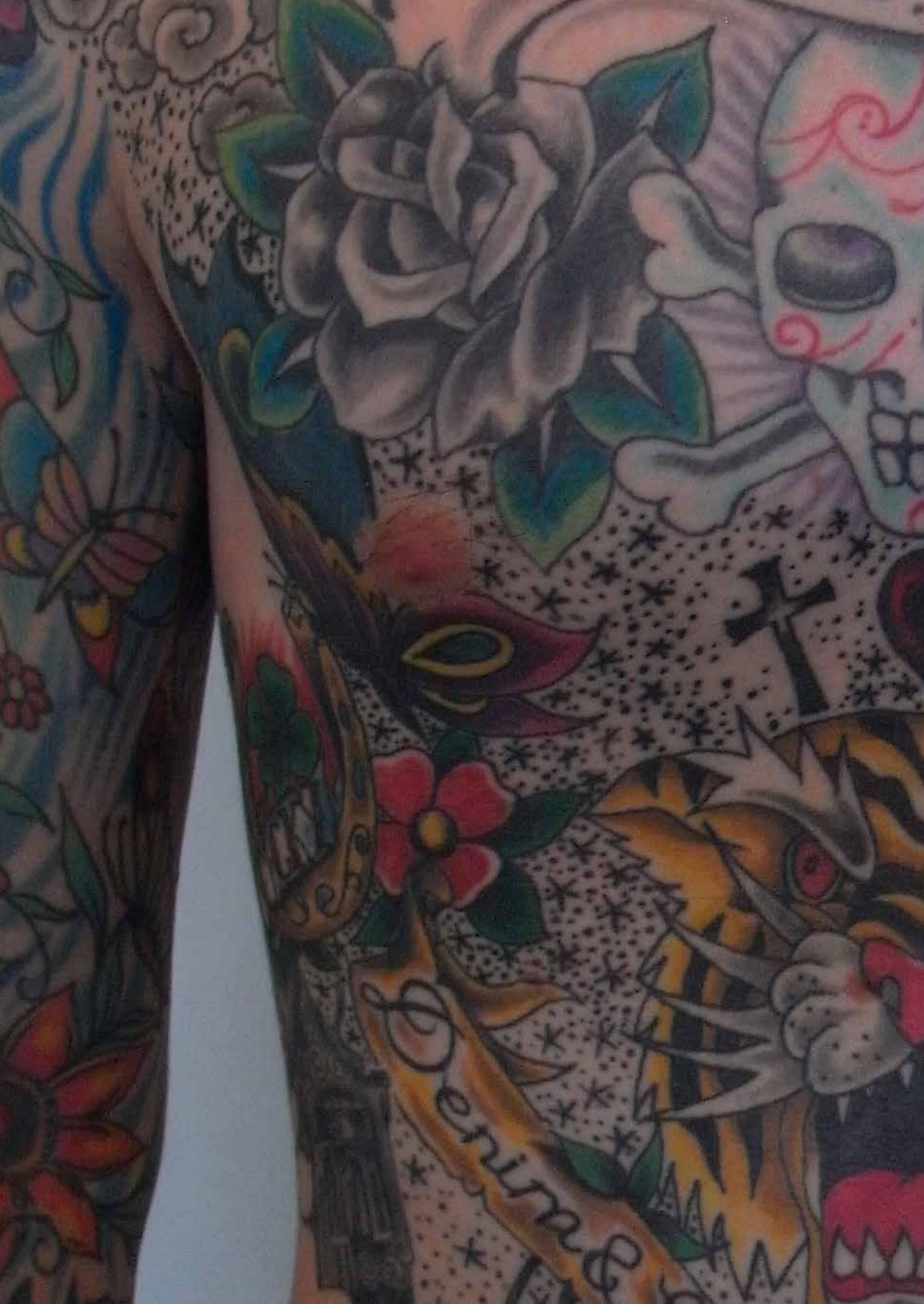
The logo is, to be more precise a detail of the appeal to Christ drawn at the very start of the 2nd line of the signature phrase of the Fulda donation letter, see figure below. In the middle ages it was in such important documents common to open with decorative elements (Krisnoms) expressing obedience to God and the Catholic Church. The extensive signature phrase and the whole text of course were made by professional writers, and the person of power as his sign off

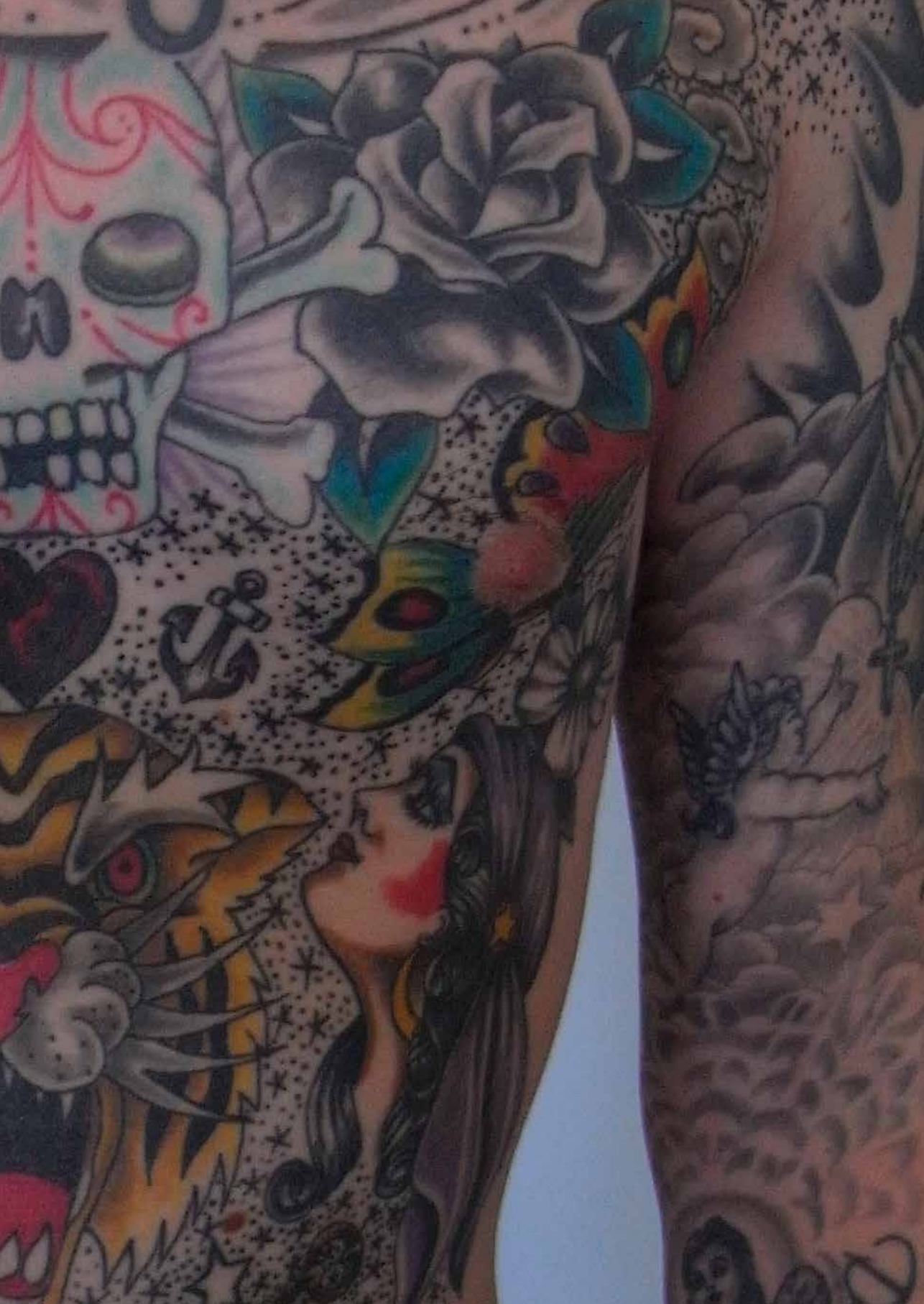


only filled in some tiny element with a primitive scratch. Charlemagne was even known not to be able to write! Documents were in Latin mastered by few outside the Church. Krisnoms often were artistic drawings free in style as we know from modern art, and from tattooes. Interestingly, the double cross sign # is for centuries used by doctors on recipes upfront the recipe message for the Pharmacist composing the medicinal remedy prescribed by the doctor for the patient. This Doctor's in-the-name of God sign and appeal is thought to originate from a Krisnom long back in time. The # sign apparently by mystic coincidence alsohas found its way to the computer keyboard.

Text of the Fulda document: Signum + Pippino glorissimo rege; Krisnom with the ECTP logo, Hithericus in vice Baddilone followed by the Chancellors artistic sign of recognition (Hitheririus subscripsi) and a small cross representing the "signature" field; data in mense Junio anno regni nostril  Actum Atiniago (or Attigny) palatio publico. Hitherius was the Chancellor, Wigbald or "Baddilone" the writer. Pippin as sign off only scratched a small cross field  in the prepared document. The original document was for many years maintained in the Prussian State Archive in Magdeburg.

*J. Serup*, September 2013





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