

Plenary lectures

Christine Keyser : Ancient DNA : from paleogenetic to paleogenomic

Institut de médecine légale. Laboratoire d'anthropologie moléculaire et imagerie de synthèse - UMR 5288 CNRS – Université de Strasbourg

Thanks to recent advances in sequencing technology, the ancient DNA field, almost 30 year-old, is now moving from paleogenetic to paleogenomic. The purpose of this presentation is to give an overview of these new developments. In a first part, the strategies developed by our team to study human specimens from protohistoric and prehistoric periods will be described. In a second part it will be shown how the recovery of DNA from paleontological remains allows the scientist to go back in time studying the genetic relationships between Humans and Neandertals. These examples will illustrate how ancient DNA data contribute to our understanding of human history.

Amra Aksamija : Analytical analysis of natural products used in cultural heritage

Carole Mathe, Cathy Vieillescazes

Laboratoire ingénierie des patrimoines naturel et culturel, IMBE – UMR 7263 CNRS - Université d'Avignon

Our laboratory is specialised in the field of chemical diagnostic in the Art and Archaeology.

The research works concern liquid and gas chromatographic studies of various natural products, in the main part regarding natural resins and dyestuffs employed for production of artistic and archaeological objects. These kinds of materials evolve in the course of time, they are degradable and oxidizable compounds, it is hence important to identify specific chemical markers of these complex mixtures. In consequence, to realise such sample analyses, powerful analytical tools must be employed.

Our principal axes of research concern natural resinous materials and natural herbal dyes.

Resinous materials are complex mixtures of various terpenoid compounds. These terpenoid compounds have different degree of condensation, then we talk about diterpenic resins, (*Coniferae* order resins, or pine resins) and triterpenic resins (olibanum or frankincense resins from *Burseraceae* family and mastic resin from *Anacardiaceae* family).

Coloured organic materials are present in the composition of many museum objects, most obviously as dyestuffs in textiles or as a paint pigments. Madder have been used since antiquity

and is therefore one of the most important of the red dyestuff of vegetable origin. This natural colourant is a derivative of anthraquinones and it is prepared from roots of the madder plant *Rubia tinctorum*. The natural yellow dyes are mostly flavanoid compounds, like dyer weed *Reseda luteola*, also used like textile's and carpet's dye.

Analysis of these materials are carried out by Liquid Chromatography with a double photodiode array and fluorimetric detection (LC/PDA/fluorimetry) and/or by Gas Chromatography coupled to a Mass Spectrometer (GC/MS). The chemical analysis of several archaeological samples will be given to prove a suitability of these procedures.

Philippe Walter : Beyond the appearance of works of art : the chemist view

Laboratoire d'archéologie moléculaire et structurale - UMR8220 – CNRS - Université Pierre et Marie Curie, Paris

The association of chemistry and art follows a long history. Since Antiquity, new products were elaborated in order to give access to chemicals used as pigments as well as in cosmetics and therapeutics. During the Renaissance period, new optical effects were invented to create glazes or glistering...

So today, the technical know-how of the ancient chemists and masters should be rediscovered thanks to the methods of the analytical chemistry. The precious character of the most famous works of art and their uniqueness imply particular cautions and require methods which may give the maximum information with the minimum of sample, if any. We will illustrate these activities with examples concerning different painting materials, from Prehistory to Leonardo da Vinci.

Startup and business incubator lectures

ALSACHIM Carmen Maieranu, PhD, Bioparc - Boulevard Sébastien Brant, 67400 Illkirch

ALSACHIM is an independent contract research and development organization specialized in the synthesis of stable isotope (Deuterium, Carbone-13, Azote-15) labeled compounds. Alsachim offers custom synthesis of stable isotopically labeled molecules including:

- Drugs
- Pharmaceutical Intermediates
- Metabolites
- Pesticides

- Internal standards for LC-MS-MS
- Advanced stable labeled building blocks

Alsachim offers also analytical chemistry services: re-analysis for new certification, metabolite identification, HPLC purity analysis; Mass spectrometry analysis: LC/MS; NMR analysis: ¹H, ²D, ¹³C, ¹⁹F, and ³¹P.

PHYTODIA Axelle Strehle, Business developer, Pôle API Bld Sébastien Brant, BP 10413 67412 Illkirch

Phytodia is a company specialized in the identification and the characterization of plant extracts for the nutraceutical, cosmetic and pharmaceutical domains. The company sustains its business partners in the development of their new ingredients/products by providing them all or part of the technical and scientific report required for marketing (traceability/quality control, marketing arguments), for REACH registration (analytical profile), or for health claim submission (validation of biological effect in vitro-in vivo). Phytodia is indeed specialized in the characterization of plant extracts and/or natural molecules from a preparative, analytical and biophysical stand point (development of analytical methods, quantification, resolution of complex mixtures...), as well as in the demonstration of biological activities (pharmacological, toxicological in vitro and early ADME) for various allegations such as slimness, aging, vitality...

SEMIA Gilles Grand, Director, 4 Rue Boussingault 67000 Strasbourg

SEMIA is the Alsatian business incubator whose mission is to assist innovative startups to develop a successful business. SEMIA is a multi-domain incubator with a focus on projects linked to public and private research (therapeutic innovation, biotechnology, informatics services and technologies, engineering). It offers wide-ranging support for entrepreneurs, covering a broad panel of services, including:

- Advisory (business plan, technology, IP, legal affairs, market, management)
- Project and general management
- Direct financing + facilitated access to public financing
- Identification of adapted facilities
- Fund raising assistance
- Access to a dynamic network and partnering capacity
- Teaching and coaching
- Soft landing incubation

Since its inception in 2000, SEMIA has incubated 120 projects, allowing the creation of 100 new companies.