

TrisKem International: New Synthesis Laboratory

UGM - 09/21/2018

Jesus College - Cambridge (UK)

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Radiopharmacy
and
Nuclear Medicine

Environment and
Bioassay

Geochemistry
and
Metals Separation

Decommissioning



➤ Environmental monitoring and Bioassay:

- Historical market – standard technology used by accredited laboratories
- Environmental & wastes monitoring (actinides, fission & activation products) in water, soil, wastes, food, bioassay, construction materials, ...
- Rapid & precise determination of radionuclides (i.e. DGT)



➤ Radiopharmacy and Nuclear Medicine

- Rapid & highly specific separation of radionuclides from irradiated targets
- Post-generator purification
- QC of radionuclides for medical uses → Therapy & Imaging (^{68}Ga , ^{89}Zr , ...)
- Radioprotection & radioanalysis
- Highly selective resins for: Lanthanides, Sr, Cu, Zr, Ac, In, Sc, Ga, ...



➤ Decommissioning

- Treatment of effluents, liquid wastes, environmental waters
- Removal of radioactive contaminants & heavy metals (Cs, Sr, Ra, I, ...)
- High volumes → inorganic matrices imbedded in polymeric matrices



➤ Geochemistry and Metals Separation

- Removing matrix interfering elements (isobaric interferences)
- Isotope ratio determination
- Applications in geochronology, dating, food provenance, nuclear forensics, ...



➤ Hydrometallurgy

- Recovery of critical metals
- Recycling

TrisKem International - Networks



➤ Member of Isotope4Life /

Atlanpole Biotherapies / ID2Santé

➤ Member of Nucleopolis

➤ Member of Prometia

➤ Laureate "Concours innovation BPI" 2018 → C.L.I.P.S. 2020

➤ Two projects financed by the BPI

– Radiopharmacy: CARAT (Orano Med, Pb-212), LU-177

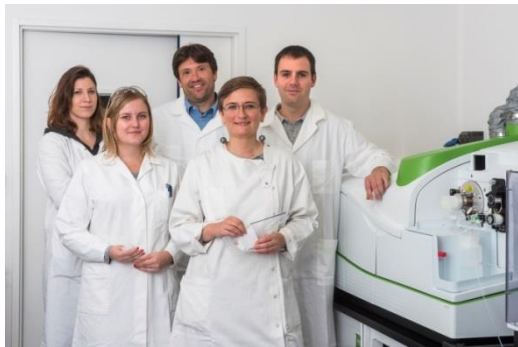
– Member of BPI Excellence & FrenchFab



➔ Importance of Networking & sharing experience/expertise

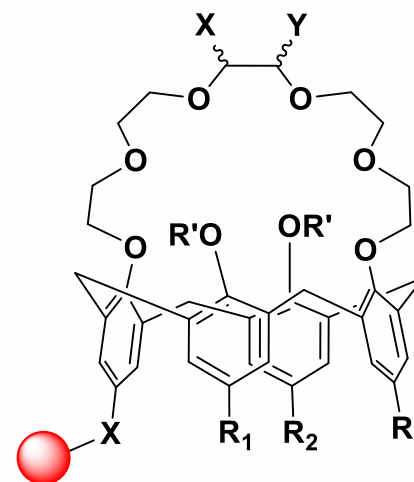
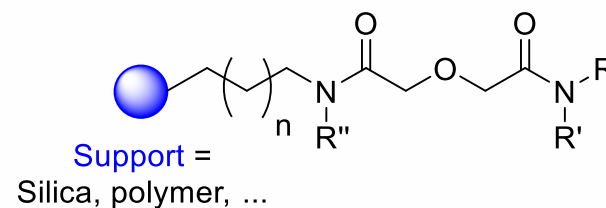
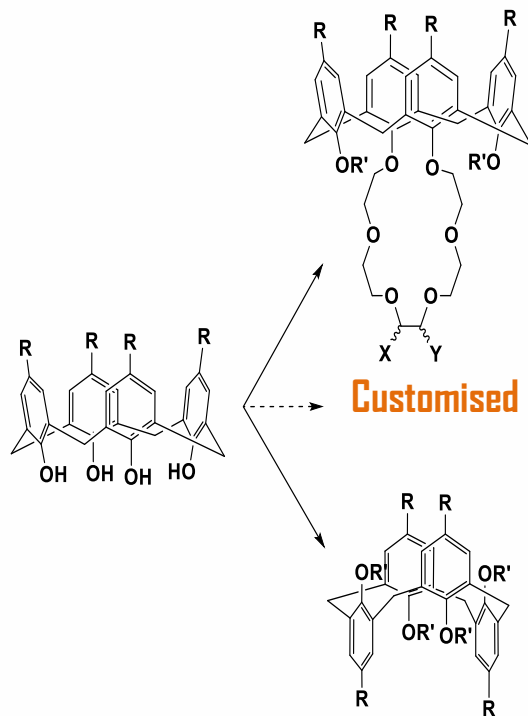
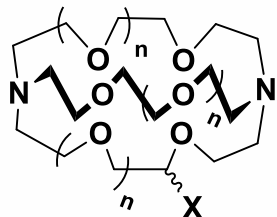
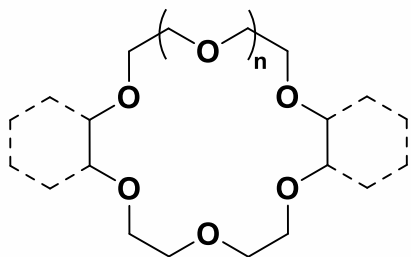


- Development of new resins, separation techniques & applications for all the domains of interest
- Two R&D labs: currently **8 people** & more to come
 - **Application:**
 - Preparation of extraction chromatographic resins (impregnation)
 - Resin characterisation
 - Development of new methods
 - But also QC (no radioactivity) → for hot QCs or β -testing: **strong partnerships**)
 - **Synthesis: new opportunities**



➤ Since 2015, dedicated to **organic synthesis**:

- Development of **new extractants** (simple molecules, macrocycles, ...)
- Development of **new grafted resins** (various supports: silica, polymers, ...) ➔ **few hundred grams**
- **Internalisation** of existing extractants



- **C.L.I.P.S. 2020:** on going **structuring project** → Installation of **two 20L reactors**:
 - **Scale-up** for grafted resins & extractants production → **few dozen kgs**
 - Commercialisation of the **first new grafted resins by 2019**
 - **Secure the supply** for existing raw materials
 - **Steady company growth** → +10 people in the next 2-3 years (looking for a R&D technician)
- **R&D Collaborations:**
 - Pr. J.-F. Carpentier & Dr. Y. Sarazin (**Univ. Rennes I**) since 02/2018 (**Postdoc A. Mocanu**, macrocycles)
 - Dr. G. Montavon (**Subatech**, Nantes) & Dr. Z. Asfari (**IPHC**, Strasbourg) since 09/2015 (**PhD Thesis, S. Khalfallah**, Development of a Ra Specific resin for environmental & medical applications)
- **Customised resins / solutions and R&D contract**
- **Open to Collaborate** for new developments and/or commercialisation



➤ Existing:

- ICP-MS Nexion 350X
 - TOC-L Shimadzu
 - IC 850 Professional
 - TGA4000 + TL8000 (transfer line)
 - FT-IR Spectrum Two
 - Benchtop NMR Spinsolve Carbon
- ➔ Collaboration with CRMPO (Univ. Rennes I) for High-field NMR, MS, Elemental analysis, ...



➤ To come:

- Microscope
- Desiccator auto
- Gas pycnometer
- Specific surface area & pore volume analyser
- Size & shape particle analyser
- Tension & compression testing machine
- Shredder
- LC-MS
- puriFlash
- Pressurised reactors...





Thank you for your attention

new website: <http://www.triskem-international.com/>

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TRISKEM
Expertise in Separation Chemistry