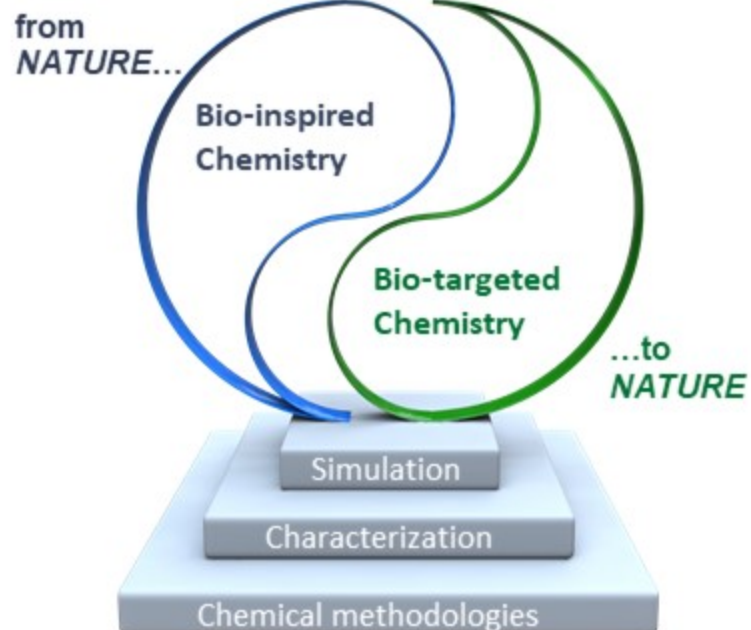


# ARCANE

## RESEARCH & INNOVATION

### ARCANE

#### A Biodriven Approach



- ✓ 7 academic laboratories
- ✓ 250 Researchers
- ✓ Multi-disciplinary network
- ✓ 28 patents



2012: ARCANE laboratory of Excellence (Labex) was launched by French government as part of "Investments for the Future" program (PIA). Funding: 9 M€ over 8 years.

2018: ARCANE is integrated to the Université Grenoble Alpes "Chemistry, Biology and Health" Graduate School. Funding: 7 M€ over 10 years.

LABEX-ARCANE@univ-grenoble-alpes.fr

### ✓ EXPERTISE

CERMAV DCM DPM LCBM LETI MEMSyMMES

Expertise Area	CERMAV	DCM	DPM	LCBM	LETI	MEM	SyMMES
<b>Bio-inspired Chemistry</b>							
Artificial enzymes	✓						
Electro- and photocatalysis							
CO <sub>2</sub> reduction/CODH	✓	✓	✓	✓	✓	✓	✓
H <sub>2</sub> evolution/Hydrogenases	✓	✓	✓	✓	✓	✓	✓
O <sub>2</sub> -small molecules activation/biocatalysis	✓	✓	✓	✓	✓	✓	✓
Water oxidation/Photosystem	✓	✓	✓	✓	✓	✓	✓
Biofuel cells	✓	✓	✓	✓	✓	✓	✓
<b>Ligand design</b>	✓	✓	✓	✓	✓	✓	✓
<b>Photochemistry</b>							
Photophysics	✓	✓	✓	✓	✓	✓	✓
Photosensitizers design	✓	✓	✓	✓	✓	✓	✓
<b>Radical-based (bio)chemistry</b>	✓	✓	✓	✓	✓	✓	✓
<b>Bio-Targeted Chemistry</b>							
<b>Bioanalysis and diagnosis</b>							
Advanced transducers	✓	✓	✓	✓	✓	✓	✓
Miniaturized analytical devices	✓	✓	✓	✓	✓	✓	✓
Signal amplification tools	✓	✓	✓	✓	✓	✓	✓
Surface patterning	✓	✓	✓	✓	✓	✓	✓
<b>Biomolecular engineering</b>	✓	✓	✓	✓	✓	✓	✓
Biotechnological strategies	✓	✓	✓	✓	✓	✓	✓
Carbohydrate chemistry	✓	✓	✓	✓	✓	✓	✓
Chemoselective ligation	✓	✓	✓	✓	✓	✓	✓
Combinatorial chemistry	✓	✓	✓	✓	✓	✓	✓
Oligonucleotide chemistry	✓	✓	✓	✓	✓	✓	✓
Peptide chemistry	✓	✓	✓	✓	✓	✓	✓
<b>Biomolecular recognition</b>	✓	✓	✓	✓	✓	✓	✓
Biomolecule/living object interactions	✓	✓	✓	✓	✓	✓	✓
Carbohydrate-protein interactions	✓	✓	✓	✓	✓	✓	✓
Multivalency	✓	✓	✓	✓	✓	✓	✓
Structural and biochemical approaches	✓	✓	✓	✓	✓	✓	✓
<b>Nanovectors</b>	✓	✓	✓	✓	✓	✓	✓
Anti-adhesion therapy	✓	✓	✓	✓	✓	✓	✓
Synthetic vaccines	✓	✓	✓	✓	✓	✓	✓
Tumor imaging	✓	✓	✓	✓	✓	✓	✓
Tumor targeting/delivery	✓	✓	✓	✓	✓	✓	✓
<b>Emergence core/Technical pillars</b>							
<b>Advanced characterization</b>							
DNP-enhanced NMR methods	✓	✓	✓	✓	✓	✓	✓
NMR Resolution/Sensitivity improvement	✓	✓	✓	✓	✓	✓	✓
Sensors, Electronic noses	✓	✓	✓	✓	✓	✓	✓
<b>Self-organization/assembly</b>	✓	✓	✓	✓	✓	✓	✓
<b>Simulation</b>	✓	✓	✓	✓	✓	✓	✓
Experimental-computational approaches	✓	✓	✓	✓	✓	✓	✓
Key-property analysis	✓	✓	✓	✓	✓	✓	✓
Multiscale modeling methods	✓	✓	✓	✓	✓	✓	✓
Reactivity: meta-dynamics, force-fields	✓	✓	✓	✓	✓	✓	✓
<b>Surface chemistry</b>							
Green chemistry	✓	✓	✓	✓	✓	✓	✓
Multi-functionalization	✓	✓	✓	✓	✓	✓	✓
Multiscale control of conductive surfaces	✓	✓	✓	✓	✓	✓	✓
<b>Synthesis</b>							
Flow chemistry	✓	✓	✓	✓	✓	✓	✓

### ✓ 7 ACADEMIC LABORATORIES IN NETWORK

**Centre de Recherche sur les Macromolécules Végétales**  
**Cermav**  
 Head of department: HEUX Laurent  
 Valorization and communication: ORTEGA MURILLO Sonia & SPEZIANI Carole  
 ☎ [sonia.ortega@cermav.cnrs.fr](mailto:sonia.ortega@cermav.cnrs.fr) ☎ +33 (0)4.76.03.76.49  
 ☎ [carole.speziani@cermav.cnrs.fr](mailto:carole.speziani@cermav.cnrs.fr) ☎ +33 (0)4.76.03.76.33

Specialized in glycosciences, from glycans (oligo- and polysaccharides) involved in biological process to bio-based materials. Design, synthesis, biosynthesis, biodegradation, characterization and processing of oligo- and polysaccharides. From academic research to applied research and start-up creation.

5 scientific teams, 26 researchers, 22 technical staff

- Chemistry and Biotechnology of Oligosaccharides – CBO
- Self-assembly of Glycopolymers – SAG
- Structural and Molecular Glycobiology – GBMS
- Structure and Modification of Polysaccharides – SMP
- Structure and Properties of Glycomaterials – SPG

CS40700 - 38041 Grenoble cedex 9 [www.cermav.cnrs.fr](http://www.cermav.cnrs.fr)

**dcm**  
 département chimie moléculaire  
**Département de Chimie Moléculaire**  
 Head of department: BOTURYN Didier  
 Valorization and communication: GONDRAN Chantal & MINASSIAN Frédéric  
 ☎ [frederic.minassian@univ-grenoble-alpes.fr](mailto:frederic.minassian@univ-grenoble-alpes.fr) ☎ +33 (0)4.76.63.56.08  
 ☎ [chantal.gondran@univ-grenoble-alpes.fr](mailto:chantal.gondran@univ-grenoble-alpes.fr) ☎ +33 (0)4.56.52.08.09

Research activities on Chemistry, Health, Physico-chemistry of interfaces, based on the design of molecules and molecular building blocks.

5 scientific teams, 60 researchers, 30 technical staff

- Bioelectrochemistry for sensors, energy and nanomaterials – BioSEN
- Biomolecular engineering and interactions – I2BM
- Redox Inorganic Chemistry – CIRé
- Spectrometry, interactions and theoretical chemistry – SITH
- Synthesis and Reactivity in Organic Chemistry – SeRCO

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**dpm**  
 département de pharmacochimie moléculaire  
**Département de Pharmacochimie Moléculaire**  
 Head of department: WONG Yung-Sing  
 Valorization and communication: BOUCHERLE Benjamin  
 ☎ [benjamin.boucherle@univ-grenoble-alpes.fr](mailto:benjamin.boucherle@univ-grenoble-alpes.fr) ☎ +33 (0)4.76.63.52.95

Research activities on Chemistry, Medicinal Chemistry, Health, Chemical Biology, Physicochemistry, Pharmaceutical Sciences. Bioconjugation, Aptamers selection (SELEX), Biosensor design, Nanoassembly of nucleic acids, Nanovectorization, Fluorogenic probes, Chemistry of natural products, Membrane crossing agents

2 scientific teams, 22 researchers, 10 technical staff

- New Tools for Vectorization and Analysis – NOVA
- Chemical biology & Organic chemistry for Medicinal Targets & Tools – COMET

470 rue de la Chimie - 38400 St Martin d'Hères [www.dpm.univ-grenoble-alpes.fr](http://www.dpm.univ-grenoble-alpes.fr)

**CBH Graduate School**  
 Université Grenoble Alpes



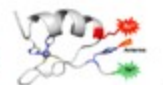
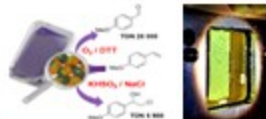
## lcbm Laboratoire de Chimie et Biologie des Métaux

Head of department: ARTERO Vincent  
 Valorization and communication: KOEPF Matthieu  
 ✉ [matthieu.koepf@cea.fr](mailto:matthieu.koepf@cea.fr) ☎ +33 (0)4.38.78.91.08

The LCBM project focuses on deciphering relations between the structure, reactivity and regulation of complex biological systems involving metal ions, and in applying this knowledge to propose often bioinspired solutions for health, environment and energy.

8 scientific teams, 41 researchers, 21 technical staff

- > BioCatalyse – BioCat
- > Bioinorganic Catalysis and Environment – BioCE
- > BioEnergy and Environment – BEE
- > Computational chemistry, Modelling and X-rays – CoMX
- > Metals and Organs – Met&Or
- > Physicochemistry of Metals in Biology – PMB
- > Proteomics for Microbiology, Immunology and Toxicology – ProMIT
- > Solar Fuels, Hydrogen and Catalysis – SolHyCat



CEA Grenoble - 17 Rue des Martyrs - 38054 Grenoble Cedex 9 [www.lcbm-lab.fr](http://www.lcbm-lab.fr)

## leti Laboratoire d'électronique et de technologie de l'information

Head of laboratory: VIGNOUD Séverine  
 Valorization and communication: NONGLATON Guillaume  
 ✉ [guillaume.nonglaton@cea.fr](mailto:guillaume.nonglaton@cea.fr) ☎ +33 (0)4.38.78.91.29

Physico-Chemistry of Interfaces for Health: From surface chemistry to body monitoring and actuation. Micro & nano technologies, Digital radiation Detectors for medical imaging and homeland security, Molecular Imaging and drug delivery, Lab-on-chip for *in vitro* diagnostics, Environmental monitoring and control, Wearable and implantable medical devices

18 researchers, 8 technical staff

- > (Bio)sensors and actuators
- > Delivery systems: micro-needles, lipid nanoparticles...
- > Surface Chemistry



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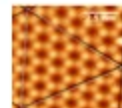
## MEM Modélisation et Exploration des Matériaux

Head of department: DEUTSCH Thierry  
 Valorization and communication: HEDIGER Sabine  
 ✉ [sabine.hediger@cea.fr](mailto:sabine.hediger@cea.fr) ☎ +33 (0)4.38.78.65.79

Development of advanced techniques for material characterization and simulation. Advanced Microscopies and ion beams, X-rays, Nanostructures and Synchrotron radiation, Nuclear magnetic resonance, Dynamic nuclear polarization, Neutron diffraction, Numerical simulation

6 scientific teams, 36 researchers, 7 technical staff

- > Laboratory for advanced microscopies – LEMMA
- > Magnetism and Neutron scattering – MDN
- > Nanostructure and synchrotron radiation – NRS
- > NMR laboratory – RM
- > Simulation lab – LSim
- > X-ray laboratory – SGX



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## SyMMES Systèmes Moléculaires et nanoMatériaux pour l'Énergie et la Santé

Head of department: DELANGLE Pascale  
 Valorization and communication: BOUCHET-SPINELLI Aurélie  
 ✉ [aurelie.bouchet-spinelli@cea.fr](mailto:aurelie.bouchet-spinelli@cea.fr) ☎ +33 (0)4.38.78.48.33

Design, synthesis, study of innovative and original architectures and functional materials. Interests in reactivity and properties of biomolecules, bringing an original approach to biological questions

4 scientific teams, 47 researchers, 17 technical staff

- > Chemistry at the interface of biology for environment, health and toxicology – CIBEST
- > Design of molecular architectures and electronic processes – CAMPE
- > Recognition and study of biological assemblies – CREAB
- > Synthesis, structure and properties of functional materials – STEP



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## EQUIPMENT CERMAV DCM DPM LCBM LETI MEM SyMMES

	P	P	P			
Biomolecules interactions						
Bilayer Interferometry						
Electrophoresis		✓	✓	✓	✓	✓
Fluorescence scanner					✓	✓
ITC	✓	✓				
QCM, QCM-D			✓		✓	
SELEX Technology			✓		✓	
SPR	P/✓	P	P			✓
Cell culture / Characterization						
Eukaryotic/Prokaryotic BL2 laboratory				✓	✓	✓
Flow cytometry					✓	✓
L2 phage					✓	✓
qRT-PCR		✓	✓	✓	✓	✓
Charge transport measurements						
TOF, photo-CELIV						✓
Chemical Libraries						
Electrochemistry			✓	✓		
Battery cyclers						✓
Electrochemical impedance spectroscopy			✓		✓	✓
Potentiostats			✓		✓	✓
Spectro electrochemistry				✓	✓	✓
Elemental analysis (CHONS)						
Liquid Phase Deposition Techniques			✓			
Dip coating						✓
Electrospinning	✓					
Depositing robots	✓				✓	
Screen printing					✓	✓
Spin coaters				✓	✓	✓
Mechanical characterization						
DMA, micro mechanical test, Texture analyzer			✓			✓
Metal coating (Thermal evaporator)	✓					
Microscopy	✓					
Epifluorescence microscope		✓			✓	
Optical microscope	✓					✓
TEM/SEM	✓	P	P	✓	✓	✓
Mineral quantification (ICP-OES)						
Molecular modelling	P				✓	
Access to clusters		✓	✓	✓	✓	✓
Schrödinger suite	✓		✓	✓	✓	
Supercomputing	✓		✓	✓	✓	

P : Institut de chimie moléculaire de Grenoble ICMG

## EQUIPMENT CERMAV DCM DPM LCBM LETI MEM SyMMES

Separation / Purification techniques						
Capillary Electrophoresis			✓			
FPLC for protein purification		✓		✓		✓
GC-MS/FID/ECD (Pyrolyse, HS)-GC-MS	✓	✓				
IC-PAD						✓
HPLC for biomolecules purification	✓	✓		✓		✓
LC (MS/UV/FLUO/DAD/LS)		✓		✓	✓	✓
LPLC, HPSEC, GPC, HPAEC	✓					
Solar cell characterization						
Ageing chamber						✓
Irradiation benches				✓		
I/V, IPCE measurements					✓	✓
Solar simulator					✓	✓
Spectroscopy / Spectrometry						
DLS	✓		✓	✓	✓	✓
DNP						✓
Electrospray	P	P	P			✓
EPR		✓	✓			✓
Fluorescence Polarization	✓	✓	✓			✓
Laser nano / picosecond		✓	✓			✓
MALDI-ToF	P	P	P			✓
Mössbauer					✓	✓
NMR	P	P	P	✓		✓
NTA	✓					✓
Polarimetry, Circular Dichroism	✓	✓		✓		✓
qNano						✓
Raman		✓				✓
SLS	✓					✓
Spectrofluorimeter	✓	✓	✓	✓	✓	✓
SQUID						✓
UV-vis/FTIR/NIR	✓	✓	✓	✓	✓	✓
X-Ray	P	P	P	✓		✓
Supercritical Phase Deposition (SFD)						
Surface characterization						
AFM	P	P	P		✓	✓
BET Analysis	✓				✓	✓
Contact angle	✓	✓			✓	✓
Ellipsometry					✓	✓
Nano / robot spotter		✓		✓	✓	✓
Plasma O <sub>2</sub>	✓				✓	✓
Solid Surface ζ Analyzer					✓	✓
4-point probe conductivity		✓				✓
Synthesis						
Automated oligonucleotide & peptide synth.			✓			✓
Fermentors	✓			✓		
Flow chemistry						✓
High-pressure reactor		✓			✓	✓
Inert atmosphere glove box system		✓			✓	✓
Microwave reactor	✓	✓	✓	✓	✓	✓
Parallel synthesis		✓			✓	✓
Photochemical reactor, Incubator, Heat chamber	✓	✓				✓
Tray Freeze-dryer				✓	✓	✓
Ultracentrifuge	✓	✓	✓	✓		✓
Rheology						
Rheometer and rotational rheometer	✓				✓	
Thermal characterization						
DSC and micro DSC, TGA	✓					
Vapor Phase Deposition Techniques						
MVD					✓	
Plasma etcher					✓	
PVD sputtering					✓	
CVD and MOCVD reactors	✓	✓				✓
Solvent vapor annealing	✓					



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