

Biological and chemical labs at ELI Beamlines

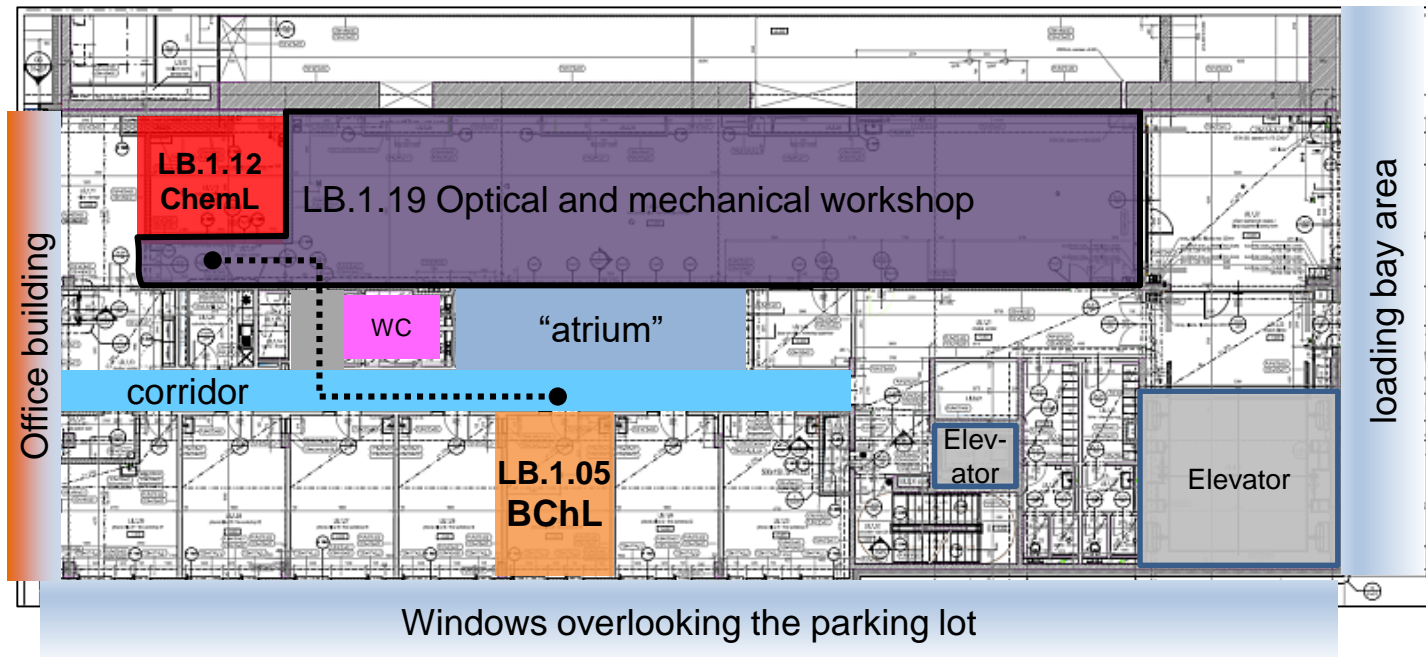
Winter 2019 status

Martin PRECEK
Research Program 4:
Applications in Molecular, Biomedical, and Material Sciences

Capabilities of BioChemLAB and ChemLAB

- primarily oriented towards “wet” sample work
- supporting activities for preparation of solid targets can be performed (→ Target program)
- **ChemLAB** (LB.1.12)
 - storage of chemicals
 - works with larger volumes of hazardous liquids (fume hood)
 - preparation of stock solutions
 - 3D printing (smelly, needs water cleaning)
- **BioChemLAB** (LB.1.05)
 - preparative work on liquid and solid samples of biological, chemical or material nature
 - characterization of samples by special instruments
 - E.g. Measuring optical spectra, Optical microscopy

Laboratory building - Floor 1



Controlled environment chambers:

- chemical fume hood (width: 150 cm)
- hazardous chemical storage cabinets (corrosives, flammables, toxics)
- biological safety cabinet/box (width: 120 cm)
- inert gas glove-box (acrylic, w: 85 cm) with transfer chamber (30 cm)
- refrigerator-freezer (+4°C/-18°C), deep freezer (-85°C)
- temperature controlled water bath shaker (28 liter, from ambient to 99 °C)
- ultrasonic bath (heated, 3 liters capacity)
- forced convection ovens / sterilizers (up to +250°C)

Tools and consumables:

- small unit for purified deionized water (type I, 18.2 MΩ.cm)
- magnetic stirring hot plates (up to 550°C), shakers, and a vortexer
- pipettors
- centrifuges (small: 15000 rpm, large: 4200 rpm)
- glassware, plasticware
- starting chemicals (acids, bases, buffer salts, organic solvents)

Instruments:

- analytical balance (+/- 0.01 mg), precision balances (+/- 10 mg)
- UV-VIS-NIR spectrophotometer (190-1100 nm) for liquid cells
 - upgrade for solid sample reflection spectra possible
- compact fiber spectro-fluorimeter with LED excitation sources
 - primarily for liquid samples
- optical stereomicroscope (8x – 80x magnification, trinocular)
 - upgraded with a digital camera
- pH-meter, also measures redox potential, or selected ions with special electrodes

+ some ELIBIO biolaboratory instruments in temporary asylum

- ZEISS upright fluorescence microscope
- Shimadzu compact FTIR spectrometer 7800 – 350 cm^{-1}

BioChemLAB – left



BioChemLAB – right



ChemLAB - left





Glove box

SICCO Glove Box with Transfer Chamber

Panels:	Material:	Temperature resistance:	Use:	Stand:
clear	PMMA	-20 °C to +70 °C	normal pressure	rubber feet



Access policy, safety

Both labs contain unique safety hazards

- chemicals: corrosive, toxic, asphyxiating, irritating, carcinogenic, oxidizing, flammable
- bio-samples: should be BSL1 – could be hazardous to your pets
- other: vacuum, glassware, sharp instruments, hot liquids, hot ovens, etc.

--> To get permission for independent access and work in the labs, a training will have to be performed

- “Operating Rules document” training: 90-120 minutes

access privileges are granted to selected persons (some 40 up to now) based on a reasonable case after safety training

- lab responsible: Martin Precek

Limited workspace area

- workspace/time **priority will almost always be issued for RP4 team persons** and their Users

See you in the lab!



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