SELECTED OFFERS FROM THE SCIENTIFIC DIVISIONS OF THE FACULTY OF PHYSICS, UNIVERSITY OF WARSAW

1) DIVISION OF BIOPHYSICS INSTITUTE OF EXPERIMENTAL PHYSICS, FACULTY OF PHYSICS, UNIVERSITY OF WARSAW

Keywords of the proposed subject areas

biopolymers and their complexes in *in vitro* and *in vivo* processes; molecular crowding; molecular spectroscopy; time-resolved crystallography; microscopy; FLIM imaging.

Laboratory equipment available in the division

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(1) Analytical ultracentrifuge ProteomeLab XL-I Beckman Coulter equipped with an additional fluorescence detector AVIV Biomedical Inc.
(2) Multifunctional emission spectroscopy system: integrated FCS-FLIM Alba SN spectrofluorometer, high-resolution time-resolved spectrofluorometer Chronos SN 44 with Mai Tai HP Spectra Physics and Mira 900F-Innova I-310 Coherent lasers (at the stage of development, full utilisation probably on December 2019).
(3) X-Ray diffractometer SuperNova A (Cu) Diffraction System, Oxford Diffraction System, Agilent Technologies, equipped with Mosquito crystallisation robot and stereoscopic microscopes.
(4) Nuclear magnetic resonance spectrometer Bruker ASCEND 500 MHz with equipment.
(5) CD spectrophotometer CHIRASCAN Applied Photophysics.
(6) Stopped-flow spectrophotometer FX20 Applied Photophysics.
(7) Microcalorimeter ITC-200 MicroCal and absorption UV-VIS spectrophotometer V-650 Jasco for precise measurements of concentrations.
(8) Microcalorimeter DSC Malvern VP-DSC MicroCal.
(9) Mass spectrometer API 3200 AB Sciex
(10) DNA/RNA synthesizer ÄKTA OLIGOPILOTplus Donserv.
(11) Thermocyclers: „Real Time" PCR CFX 96 Bio-Rad and BIO-RAD T100.
(12) Scintillation counter Perkin Elmer Tri-Carb 2810 TR
(13) Time-resolved spectrofluorometers: Fluorolog-3Tau SPEX and PicoQuant FluoTime 300 Cary Eclipse Agilent Technologies.
(14) Steady-state spectrofluorometers LS-55 Perkin Elmer
(15) Absorption UV-VIS spectrophotometers Cary 100 and Shimadzu UV mini 1240, and IR spectrophotometers Shimadzu IR Affinity.
(16) Automatic electrophoresis Experion Bio-Rad, liquid chromatographs HPLC Agilent 1200, and FPLC AKTA Purifier 10.
(17) Ultracentrifuges Avanti J-26 XPI Beckman Coulter.
(18) Equipment for protein expression in bacteria, including autoclaves Laboklav 135 V Labo Baza and EnbioJet MicroJet, as well as steam sterilisers SMS ASL 80B.
(19) Laboratory equipment for spectroscopic measurements, chemical syntheses, and enzymology, including dryers, low-temperature freezers (–80ºC), cooling chamber, rotavapors, precise laboratory scales, etc.
(20) Access to high-field NMR spectrometers (800 MHz) in University of Warsaw Biological and Chemical research Centre, and to surface plasmon resonance (SPR) in International Institute of Molecular and Cell Biology in Warsaw.

2) DIVISION OF OPTICS INSTITUTE OF EXPERIMENTAL PHYSICS, FACULTY OF PHYSICS, UNIVERSITY OF WARSAW

LABORATORY OF MOLECULAR STRUCTURE AND DYNAMICS

Infrastructure available in the laboratory

The available infrastructure enables experiments with degenerate Fermi gases (potassium-40) and Bose-Fermi mixtures of potassium and cesium as well as isotopic mixtures of potassium. Major elements of the experimental setup have been already built (laser systems, control systems, associated electronics, vacuum setups). The laboratory is now ready for pursuing novel research topics, in particular involving atomsin optical lattices and/or experiments leading to the creation of ground state molecules of KCs. Other promising avenues can be also explored. Currently 6 students are involved in the experiments (one bachelor student, four master's students and one PhD student).

The main equipment in the laboratory:

1) Titanium sapphire lasers: M2 Solstice and Tekhnoscan with Lighthouse Photonics pump lasers,
2) 50 W Nufern amplifier with a seeder at 1064 nm,
3) operational laser system for laser cooling of cesium based on Toptica TA Pro lasers,
4) operational laser system for laser cooling of all potassium isotopes based on Toptica TA Pro lasers,
5) three optical tables (one with a non-magnetic top layer),
6) RF spectrum analyzers, fast oscilloscopes, power meters etc.,
7) NI real time computer for the experimental sequence control.