

Membrane Biology

The Integrated Research Training Group (IRTG) provides a platform for structured and complementary training of all doctoral candidates within the Collaborative Research Center (CRC) **Scaffolding of Membranes - Molecular Mechanisms and Cellular Functions**. It fills an important gap in postgraduate education in the Berlin area in the field of **membrane biology**. Moreover, the IRTG provides an excellent framework to integrate research and postgraduate education at the participating universities (FU Berlin with Charité Universitätsmedizin, Universität Potsdam) and non-university research institutions (DIfE, DZNE, FMP, MDC).

Focus

The CRC's aim is to elucidate the molecular mechanisms by which dynamically organized protein-protein assemblies scaffold cellular membranes and exert cellular functions. The IRTG program aims to educate doctoral candidates in a **multidisciplinary approach** combining cell and molecular biology, biochemistry, structural biology and optical (bio)physics.

In particular, the study program introduces doctoral candidates trained in molecular biology to protein structural and biophysical methods. Conversely, doctoral candidates with a strong background in biophysics are exposed to basic methods and concepts in molecular cell biology.

IRTG is embedded in the existing doctoral program **Biomedical Sciences** at Dahlem Research School. The study program consists of scientific lectures, seminars and courses and also provides several opportunities for doctoral candidates to acquire soft skills.

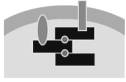
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Deadlines: calls and deadlines vary
Places: 27
Scholarships: 7 short-term scholarships



Typical Study Curriculum

Successful completion of the IRTG study program requires PhD students to obtain at least **30 credit points (CP) in total over 3 years** with approximately 11 CP for the first year and second year, and 8 CP for the third year.

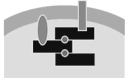
The numbers shown are the corresponding credit points (CP).

	First Year	Second Year	Third Year
Obligatory Courses			
SFB Colloquium	1	1	1
Progress Report / Mentoring Meeting	1	1	1
Lab Report	1	1	1
Summer School	1,5	2	2
Interdisciplinary Lecture Series	1	1	1
Good Scientific Practice	0,5		
Elective Courses			
Elective Scientific Courses	2	2	2
Soft Skills	3	2	
Lab exchange		1	
	11	11	8

Out of the 30 CP acquired during the 3-year period 18 CP are contributed by obligatory courses and 12 CP must be obtained from a selection of elective courses (from the DRS program Biomedical Sciences or other doctoral programs).

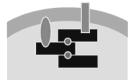
Overview of the obligatory courses of the IRTG within the CRC 958.

	Time	Frequency
SFB Colloquium	half day	5 times per semester
Lab Report	2 hours (plus preparation time)	1 per year
Progress Report / Mentoring Meeting	2 hours (plus preparation time)	1 per year
Summer School	3 days	1 per year
Interdisciplinary Lecture Series	2 days	1 per year
Good Scientific Practice	1 - 2 days	one time during PhD



Project Groups, Research Areas and Projects of the CRC 958

Project	Title	Research Area	Principal Investigator(s), Department, Institution
A01	Structural and functional organization of endocytic scaffolds within the periaxial zone	Cell Biology, Neurobiology	Haucke, FMP; Maritzen, FMP
A03	In vivo analysis of active zone assembly	Cell Biology, Genetics	Sigrist, Biologie, FUB
A04	Spatiotemporal model of neuronal signaling and its regulation by presynaptic membrane scaffolds	Bioinformatics, Biophysics	Noé, Mathematik, FUB
A05	Role of RBP in synaptic transmission and plasticity	Neuroscience, Cell Biology	Rosenmund, NWFZ, CHA; Schmitz, CHA
A06	Organization of the synaptic active zone scaffolds	Biochemistry, Cell Biology, Structural Biology	Wahl, Biochemie, FUB; Sigrist, Biologie, FUB
A07	Regulation of SH3 domain-containing scaffolds in endocytosis and synaptic vesicle cycling	Biochemistry, Cell Biology	Freund, Biochemie, FUB; Haucke, FMP
A09	Substrate directed organization of mechanotransduction microdomains by stomatin-domain scaffolding proteins	Sensory Neurobiology, Ion Channels, Molecular Physiology	Poole, MDC; Lewin, MDC
A11	Structural and functional analysis of septin scaffolds assembled at the plasma membrane	Biochemistry, Cell Biology,	Krauß, FMP Daumke, MDC
A12	Structural and functional examinations of nucleotide-dependent membrane scaffolds	Structural Biology, Biochemistry, Cell Biology	Daumke, MDC; Spahn, Medizinische Physik und Biophysik, CHA
A13	Golgi-associated protein scaffolds regulating lipid droplet and lipoprotein biogenesis	Molecular Biology, Cell Biology, Endocrinology	Schürmann, DIfE
A16	Organization of membranous PTEN-based protein scaffolds and signaling systems in neurons	Biochemistry, Cell Biology, Neurobiology	Eickholt, CHA
A17	Protein scaffolds in synaptic endomembrane degradation	Developmental Biology, Neurobiology	Hiesinger, Biologie, FUB
A18	Synaptic scaffold proteins regulate presynaptic autophagy	Cell Biology, Imaging, Proteomics	Garner, DZNE



Project	Title	Research Area	Principal Investigator(s), Department, Institution
A19	Regulation of MAGUK scaffold assembly and function at the synapse	Structural Biology, Biochemistry, Cell Biology	Shoichet, CHA; Wahl, Biochemie ,FUB
A20	Septin-dependent compartmentalization of BMP2-signaling in cell migration	Imaging, Cell Biology, Biochemistry	Ewers, Biochemie, FUB; Knaus, Biochemie, FUB
A21	Splicing-mediated regulation of Sec16-directed COPII scaffold assembly	Cell Biology, Biochemistry	Heyd, Biochemie, FUB
A22	Interactions of the membrane-associated CCM-protein scaffold with adherens junction and integrin complexes during angiogenesis and blood vessel maturation	Developmental Biology, Imaging, Biochemistry	Seyfried, Biochemie und Biologie, UP
A23	Characterization of the membrane scaffold complexes that tune photoreceptor neuron function	Neurobiology, Genetics, Development, Neuroethology	Wernet, Biologie, FUB
Z02	Advanced and super-resolution microscopy to resolve spatial and temporal dynamics of nanoscale membrane scaffolds	Imaging	Schmoranzner, Biochemie, FUB, CHA; Ewers, Biochemie, FUB
Z03	Proteomic analysis	Protein Chemistry, Proteomics	Freund, Biochemie, FUB
MGK	Integrated Research Training Group	Teaching	Knaus, Biochemie, FUB; Krauß, FMP

University Institutions

Charité – Universitätsmedizin Berlin (CHA)

Freie Universität Berlin (FUB)

Neurowissenschaftliches Forschungszentrum (NWFZ); Charité Research Center

Universität Potsdam (UP)

Non-University Institutions

Deutsches Institut für Ernährungsforschung (DIfE)

Deutsches Zentrum für Neurodegenerative Erkrankungen (DZNE)

Leibniz-Institut für Molekulare Pharmakologie (FMP)

Max-Delbrück-Centrum für Molekulare Medizin (MDC)