ECVAA Residency Training Programme

Core Facility Experimental Biomodels, Biomedical Research, Medical University Graz, Austria

The **Division of Biomedical Research (Core Facility Experimental Biomodels)** at the Medical University of Graz, Austria is an approved Satellite Training Centre of the ECVAA and provides an insight into the day-to-day practice of laboratory animal anaesthesia, analgesia, and perioperative care, especially in larger laboratory animals. The Biomedical Research division is ISO-certified and all animal experiments, including animal experiment applications, husbandry and perioperative care, are performed according to Austrian / European law.

The core facility is equipped with state-of-the-art equipment and provides veterinary support for experimental procedures in which anaesthesia and analgesia are required. Cardiovascular, neurovascular, orthopaedic, and transplantation surgeries are highly represented in our case history, mostly carried out in pigs, minipigs, sheep, and goats.

The **ECVAA SATELLITE TRAINING CENTRE Graz** contributes to the ECVAA residency training for the following species:

- Pigs / Minipigs
- Sheep
- Goats
- Rabbits
- Rats

The objectives of the Standard / Alternative ECVAA Residency Training Programme (see also: http://www.ecvaa.org) are supported by the core facility, especially in terms of laboratory animal anaesthesia and analgesia, providing:

- Theoretical and practical proficiency in veterinary anaesthesia and analgesia, especially in laboratory animals like pigs, sheep, goats, and rabbits.
- Insight into biomedical and surgical animal research settings (including applications of animal experiments according to European / Austrian law).
- Support for practical experiments in veterinary anaesthesia and analgesia under biomedical and surgical research conditions.

The training improves the residents' knowledge and practical skills in anaesthesia, analgesia, and perioperative care in the species mentioned above in medical research settings, according to case availability.

Visiting residents will be directly involved in the perioperative aesthetic and analgesic management of pigs, sheep, goats, and rabbits that undergo experimental procedures. The focus lies on gaining theoretical knowledge and practical experiences with application methods, sedation, premedication, induction, intubation, maintenance, monitoring, recovery, pain scoring, humane endpoints, and euthanasia.

The indications for anaesthesia / analgesia and the demands on the anaesthetic and analgesic regime in a biomedical / surgical research setting differ from clinical settings, depending on the project's research question. Research projects related to the following medical topics are common indications at the Core Facility Experimental Biomodels: cardiovascular research (e.g. cardiac implants, myocardial infarction), neurosurgical research (e.g. peripheral nerve prosthesis), osteosynthesis (e.g. varying implantations for different osteosynthesis indications), organ transplantations (e.g. kidney, liver), new surgical techniques (e.g. laparoscopic and acute trauma surgery), new drug-delivery systems (e.g. open flow micro perfusion OFM), studies concerning wound healing (e.g. burning wounds), and more.

These settings allow introducing residents to a large variety of applications and expertise in veterinary anaesthesia and analgesia that are otherwise hard to find in such a concise manner.

Residents are welcome throughout the year depending on the core facility's project schedule and main interests of the residents.

ECVAA residents will provide anaesthesia, analgesia, and peri-operative care to the experimental animals under the direct supervision and training of the ECVAA Diplomate. Furthermore, residents will profit from routine scientific exchange with the University's veterinarians, technicians, medical doctors, and researchers with different fields of expertise. This also includes team member's skills obtained at the European College of Laboratory Animal Medicine (ECLAM), so that all kinds of questions related to laboratory animal medicine, embryo transfer (IVF), and husbandry in small, large, and exotic laboratory animals can be discussed as well. During the residency, candidates are welcome to visit and get introduced to the workflows of the Animal Facility and the Core Facility Preclinical Imaging of the Biomedical Research.

For further information please contact

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Facilities, Equipment, and Services

Facilities

Two separate premises for experimental procedures on large laboratory animals are available at the Medical University of Graz; both are centrally coordinated:

- The „Division of Biomedical Research“ (Core Facility Experimental Biomodels) with 4 operation theatres
- The „Preclinical Imaging“ area of the Human Radiology Department with 1 room for anaesthesia induction and minor surgical interventions

Operation theatres and preparation rooms (Section for Surgical Research and Division of Biomedical Research)

- Operation theatres for pigs, sheep, and rabbits
- Room for preparation, anaesthesia induction and recovery
- Areas for surgical dressing / hand washing
- Rooms for instrument preparation and sterilization of surgical equipment

Diagnostic areas

- Examination rooms equipped with ultrasound, electrocardiography (ECG) echocardiography (ECHO), and more *in vivo* analyses machines
- Laboratory equipment for blood analysis
- X-ray equipment
- Computed Tomography (CT) area (clinical)
- Magnetic Resonance Imaging (MRI) area (clinical)

Anaesthesia and Monitoring Equipment

Anaesthesia Machines

- Julian Plus, Draeger
- Aespire, Sanitas, incl. S5-Monitoring (Datex Ohmeda) and Ventilator 7100
- Primus, Draeger
- Carestation 650, Sanitas
- COMBI-VET® digital Anaesthesia Machine Systems, Rothacher Medical GmbH

Anaesthesia Monitoring Equipment

- Cardiocap, Datex
- Cardiocap II, Datex
- Siemens SC 7000, incl. Hemo 2 module
- S5, Datex Ohmeda (incl. Haemodynamic module, Spirometry, Capnography, Temp, and more)
- Infinity Delta Monitor (SpO_2, CO_2, NBP, IBP, spirometry, temp, and more)
- B155M patient monitor of Carestation 650 (incl. Hemodynamic module, Spirometry, Capnography, Temp, and more)
- Nonin 9847 V Veterinary Pulse Oximeter with CO_2-Detector
- Pulse Oximeter, OXImeter, Radiometer Copenhagen
- STIMPOD NMS 450X+, Neuromuscular Transmission Monitor
- MARTA Pad, Vigilitech, contact-free monitoring system designed to track vital signs of rodents
- Small Animal Monitoring & Gating System, MRI-compatible, Model 1030- IBP-50 (pulse, ECG, temperature, respiratory rate, invasive blood pressure), Small Animal Instruments, Inc.

Ventilators

- Oxylog 2000, Draeger
- Oxylog 2000 plus, Draeger
- Oxylog 1000, Draeger
- Pneupac® paraPAC, Smiths medical
- SAV03 Small Animal Ventilator, Vetronic Services Ltd.

Vaporizers

- Sevorane® Draeger Vapor 2000
- SevTec 7 Vaporizers, GE Healthcare
- Datex Ohmeda Isotec 5 Vaporizer
- TEC 850 Vaporizer for Sevoflurane
- Isoflurane Tec 3 Vaporizers, Rothacher Medical GmbH

Blood Analyser

- I-stat, VetScan, Abaxis
- VetScan
- EPOC blood analyser
- Fuji DRI-chem NX500
- V-Sight blood analyser

Additional Equipment

- Electric heating mats, Störk Tronic, Horn
- Bair Hugger, Patient Warming Device
- Infrared heating lamps
- Defibrillator, Responder 2000, GE Medical Systems, Berger Medizintechnik
- Heating Device, Ghibli, Roth
- ERBE Erbotom Elektrokauter for electro cautery ACC 430
- Bipolar MET, electro cautery, S.L. Fischer
- Suction Device, Sekretabsauger P 7030, MEDAP
- Homeothermic Blanket, DS36, Tecniplast
- Homeothermic Blanket, Tempcontrol II, TSE
- Homeothermic Blanket 908100-OPT-HB/15-25, TSE Systems
- Sterilizer, Autoklav HV-110 L, Ehret

As part of the Medical University of Graz, the Division of Biomedical Research is located within the human hospital area, enabling to share special aesthetic / medical equipment (e.g. life support machine, equipment for cardiopulmonary resuscitation) and expertise between biomedical researchers and clinicians.

Diagnostic Imaging Equipment

- C-bow, Mobile X-Ray, Philips
- Ultrasound Diagnostic System, Vevo 770 Imaging system, Visual Sonics Inc.
- CT Sensation Cardiac 64, Siemens (clinical CT)
- Bruker SkyScan 1276 (Micro-CT for small rodents)
- MRI Magnetom Prisma, 3 Tesla, Siemens (clinical MRT)

Services with Significant Participation of Residents and Supervisors

On a regular base, so-called “Team-Trainings” and surgical workshops (visceral trauma, acute surgery, laparoscopic surgery, and more) for medical surgeons are performed throughout the year. During these training courses, up to four pigs are anaesthetized simultaneously by veterinarians of the Core Facility Experimental Biomodels. These training courses and workshops thus represent an excellent hands-on training opportunity for ECVAA residents.