Recruitment event of IT-DED³

University Hospital of Cologne
Philipp Steven
[*ESRs 10 and 11*]

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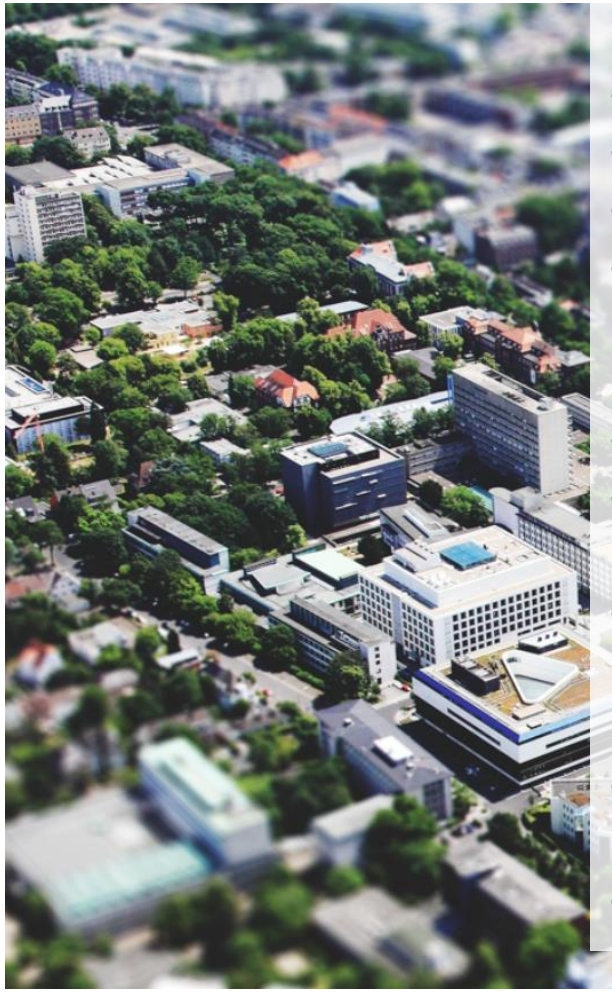

University Hospital/Medical Faculty

- Staff >10.700
- >280.000 outpatient, >60.000 inpatients
- 3.000 medical students
- Max Planck Institutions, Cluster of Excellence

Department of Ophthalmology

- 2 Chairmen, 15 Senior Consultants
- 32 Interns (11 research positions)

- Cornea, glaucoma, retina, ophthalmo-oncology, neuro-ophthalmology, ocular surface

- >7.000 inpatients, >50.000 outpatients

- Research Area: FOR2240 + 3 EU Projects

Marie Curie Actions

Ocular Surface Group

PI: Philipp Steven

Postdocs: Uta Gehlsen, Jens Horstmann

MDs: Volkan Tahmaz, Vivienne Dooling, Carolin LeBlanc

TAs: Daniela Heß, Rebecca Brückner, Margot Junker

Admin: Sonja Peperle

Student: Christiane Faust

IT-DED3

Ocular Surface Group – Main research interests

- Basic immunology of the ocular surface immune system
  - Conjunctiva-associated lymphoid tissue (CALT)
- Functional imaging of ocular surface inflammation
  - Optical coherence tomography
  - Experimental eye imaging facility
- Drug-development and –testing for ocular surface diseases
  - Artificial tears
  - Anti-inflammatory drugs
  - Cannabinoid receptor ligands

Ocular Surface Group - Concept

Basic science

Dry-eye mouse models

Ocular allergy model

Ocular GvHD models

Immunology

Non-invasive imaging

Translational studies

Drug delivery

OCT Imaging

Clinical trials center

Database EPISODE

Specialized outpatient clinics

Cologne/Zurich

Dry-eye Disease

Ocular Graft-versus-Host Disease

>1.000 patients/year

ESR 10 – project description

Main hypothesis:

Topical cannabinoid-receptor ligands for multifactorial treatment of dry-eye disease

1. **Molecular analysis of cannabinoid receptors and signal transduction**
   - **QT-PCR, FISH, etc. in mouse tissue (University Hospital Cologne)**
2. **Formulation of selective CB-R ligands**
   - **Secondment, 10 months, Novaliq GmbH, Heidelberg**
3. **Testing of candidate formulations in dry-eye animal model**
   - **Desiccating-stress mouse model, CB-R knock-out models**
   - **Histology, behavioural tests, in vivo tests, imaging (University Hospital Cologne)**

ESR 10 – secondment

Formulation of selective CB-R ligands

Novaliq GmbH, Heidelberg, Germany

~10 months duration

Supervisors: Bernhard Hauptmeier (Coordination), Frank Dautzenberg (Project Lead)

- **Formulation development based on semifluorinated alkanes**
  - **Selective CB ligands for cornea-expressed CB receptors**
- **Stability testing, various suitable methods**
- **If applicable, penetration and permeation studies via established in vitro models**

ESR 11 – project description

Main hypothesis:

Novel OCT-based tools enable better diagnosis of dry-eye disease

1. **Assessment of clinical needs and software evaluation**
   - Training in OCT [basic and clinical], meibography, confocal microscopy
   - Experimental eye imaging facility, animal models (University Hospital Cologne)
2. **Implementation and testing of novel methods in commercial devices**
   - Secondment, 10 months, Heidelberg Engineering GmbH, Heidelberg
3. **Use of novel OCT-based tools in pre-clinical and clinical setting**
   - Clinical studies in healthy volunteers and dry-eye patients
   - Desiccating-stress mouse model, substance testing (University Hospital Cologne)

ESR 11 – secondment

Implementation and testing of novel methods in commercial devices

Heidelberg Engineering GmbH, Heidelberg, Germany

10 months duration

Supervisors: Ali Tafreshi (Product Management) and Stefan Schmidt (Technical: software development and image processing)

- **Acquisition software optimization (Meibomian glands, blood vessels, corneal nerves)**
- **Implementation in commercial and experimental OCT/cSLO devices**
  - **Focus on OCT Angiography**
- **Evaluation software, validation in-house studies, optimization of graphical user interface**

Interdisciplinary Program Health Sciences (IPHS) Medical Faculty, University of Cologne

- Selection procedure by IPHS selection committee
- Two senior scientist tutors in addition to project supervisors
- Research project (min. 3 years)
- Project specific curriculum (mandatory and elective courses)
- PhD thesis and Thesis defense
- Graduation and award of the doctoral degree PhD

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Thanks for your attention