D1.8 Course Descriptions

Project Number: 675033
Project Acronym: EGRET+
Project Title: **European Glaucoma Research Training Program-Plus**

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Introduction

EGRET+ Training program has been innovative in that it covered the study of functional, structural and genetic aspects of vision, glaucoma and neurodegeneration. It has also taught the fellows the diverse skills required to become specialised glaucoma researchers.

The network wide training activities included one foundational course, three advanced training courses, and five skill modules. The courses are listed below, and described in further detail later.

Foundational Course:
“Introduction to Glaucoma”

Advanced Training Courses:
"*Visual system investigation – structure and function*"
"*Sensory biophysics and diagnostics; genetics of glaucoma*"*“Glaucoma & Statistics”*

Skill Modules:
Business Start-up
Grant Writing
Scientific Communication and Outreach
Project and Time Management
Career Planning

Foundational Course "Introduction to Glaucoma"

November 22, 2016 - During Workshop 1 (Groningen, NL)

During this Foundational Course, prof. Nomdo Jansonius [UMCG] gave an introductory lecture about glaucoma. During this, he discussed topics ranging from the glaucoma history; the anatomy of the eye; its clinical picture of glaucoma (i.e., elevated intraocular pressure, excavation of the optic nerve head, and visual field defects); different types of glaucoma; pathophysiological theories of glaucoma (i.e., role of intraocular pressure, perfusion, and intracranial pressure); visual pathway damage (beyond the eye); epidemiology of open angle glaucoma (i.e., prevalence, risk factors, end-of-life blindness), glaucoma diagnostics (i.e., onometry, perimetry, and optic nerve head evaluation); treatment options (i.e., medication, laser, and surgery); and the rare forms of glaucoma (aucre and congenital).

Furthermore, two interactive sessions were organised by Prof. Jansonius and Prof. Cornelissen in which the students had to prepare themselves by reading some literature and try to answer related questions. Specifically, for session 1 and 2 respectively, the students had to answer “Clinical Questions” related to a clinical paper and “Scientific Questions” related to a scientific paper. These answers were then discussed collectively during the group sessions.

Lastly, a visit to the Ophthalmic Clinic of the UMCG was organised, where the students gained some hands-on experience with different diagnostic tools, e.g.: optical coherence tomography, eye-pressure measurements and perimetry.

Advanced Training Course 1: "Visual system investigation – structure and function"

March 4th, 2017 - During Workshop 2 (Magdeburg, DE)

The advanced training course set the foundation for glaucoma-related vision research for the ESRs. The course was delivered through a series of presentations from leading clinicians and researchers from Germany, UK, NL, and the USA. Prof. Bach (Univ. Freiburg) presented overviews over "Electrophysiology in glaucoma" and "The meaning of optical illusions". Mr Befurth (Heidelberg Eng.) introduced "Optical coherence tomography – clinical & research applications in glaucoma". Prof. Thieme and Dr. Choritz (Univ. Magdeburg) gave a joined presentation on "Telemetric intraocular pressure monitoring – surgery and applications". Prof. Crabb (City Univ. London) provided insights on "Glaucoma – Through the eyes of the patient". Prof. Cornelissen (NL) Univ. Groningen elucidated "Insights into fMRI-based population receptive field mapping". Jun.-Prof. Hanke (Univ. Magdeburg) familiarized the ESRs with "MR-Imaging during 'natural' stimulation – relevance for visual system assessments in patients" and
Prof. Pestilli (Indiana Univ., USA) presented "Advances in diffusion weighted MR-imaging – relevance for patient assessments?"

Advanced Training Course 2: "Sensory biophysics and diagnostics; genetics of glaucoma"

November 21st and 22nd, 2017 - During Workshop 3 (Groningen, NL)

This Advanced Training Course was divided over three days. On the first day and last day, the sensory biophysics and diagnostics of glaucoma was discussed. More specifically, prof. Pim van Dijk gave two lectures about the basic principles of sound (i.e., dB, Hz, digital sound, normal and impaired hearing, etc.). Furthermore, prof. Nomdo Jansonius gave two lectures on the biophysics of vision, covering a broad range of topics (i.e., wave and geometric optics; photoreceptor physiology, photon noise and poisson statistics, contrast sensitivity, light adaptations, data-compression mechanism in the retina, etc.).

On the second and third day, the genetics of glaucoma was discussed. The first lecture focused on the genetic epidemiology of glaucoma. The international renowned expert Prof Harold Snieder held a lecture, named “Genetic Epidemiology of Eye Diseases: from Heritability to Gene Discovery”. Prof dr. Arthur Bergen gave a lecture about the “Biology of the Eye and Genetics of Glaucoma”). Subsequently, Dr Sarah Janssen (Ophthalmologist, MD) covered the subject of “Genetics and Pathology”. Finally, the course was concluded by a lecture and a hands-on workshop by Prof dr Arthur Bergen about the bioinformatic use of the knowledge database Ingenuity, which can be used to translate glaucoma disease gene knowledge into biological and pathological motifs, canonical pathways and molecular networks. Mastering these skills are essential to understand the complex etiology of glaucoma.

Advanced Training Course 3: “Glaucoma & Statistics”

March 27th, 2018 - During Workshop 4 (London, UK)

The Glaucoma and Statistics course aimed to provide PhD students with information about good practice for analysing, visualising, and reporting their data. The course was delivered through a series of presentations from leading clinicians and statisticians who specialise in glaucoma research in the United Kingdom. Professor David Crabb and Dr Anthony Khawaja discussed the importance of plotting all data where possible, use of confidence intervals when describing effects sizes, and to be cautious when using multiple statistical testing. David and Anthony gave warnings of some key pitfalls in statistical analysis, such as ensuring the PhD students choose

the correct tests, report results in an unbiased way, and have good familiarity with their data.

A workshop on how to present data in graphs and tables in an appealing way was delivered by Professor Paul Artes, with a discussion on the problem with using summary statistics alone. Finally, Dr Pearse Keane gave a presentation on current advancements in the area of Big Data and Artificial Intelligence.

https://www.city.ac.uk/news/2018/april/eu-researchers-discuss-latest-optometry-research-at-city-workshop
https://www.city.ac.uk/news/2018/april/artificial-intelligence-in-ophthalmology

Skill Module 1: Business Start-up

Business Start-up pre-course

November 21st, 2018 - During Workshop 5 (Groningen, NL)

During this one-hour Business Start-up pre-course, program manager Hinke Halbertsma gave an introduction to the Business Start-up course which prepared the ESRs for the actual course. Specially, fellows were told the general concepts and the timeline of the course. Furthermore, they were instructed to already start thinking of potential ideas in order to start the actual course well prepared. Additionally, Alessandro Grillini (former ITN fellow, and founder of Reperio) shared his experienced in taking the big step from Academia to Entrepreneurship. Grillini has participated in the Business Start-up course himself, wrote a successful business plan following this and is now owner of his own company.

Task: Following this pre-course, the ESRs were instructed to start brainstorming about potential business ideas (alone and/or together with peers) and bring them to the Business Start-up Part 1 course in Clermont Ferrand, France.

Business Start-up Part 1

April 3rd, 2019 - During Workshop 6 (Clermont-Ferrand, FR)

EGRET's first Business Start-up course was organised by Nadine Schmieder-Galfe from Eurogrant (EG), an experienced high-tech startup coach and serial entrepreneur, together with the University of Clermont-Auvergne (UCA) and Echodia. The course combined theoretical capacity development with practical application of the newly gained knowledge towards their own business ideas. During the one-day workshop, the ESRs were introduced to general concepts of technology transfer, learned about the basics of intellectual property rights with particular emphasis on patents, and learned how to use a business model canvas and various other tools to co-design in groups an own business concept based on their business ideas. ESRs teamed up in groups of 3-4 people and briefly presented their business ideas.
Furthermore, Paul Avan (UCA) and Thierry Hassoun (ECHO) gave a 45 min lecture “From the laboratory to a spin-off company, a case study” on 3 April 2019. During this lecture they explained how, over the course of 10 years of close interactions between the laboratory and its start-up, from bedside to bench and back, the concept that

intracranial pressure could be accurately measured through the ear led to the construction of specific equipment, gradually extended to host a complete handheld audiological platform unique so far. The twists and turns of the story were analyzed, for example the need for 'selling' the pressure idea outside the field of otolaryngology (the Egret+ project being one serendipitous opportunity), hence the need for the pressure device to self-calibrate, be reliable and user-friendly, which in turn attracts more ENT customers. The only critical factor is that such a story takes many years to unfold, which raises the general issue of technological innovation in the Medtech domain.

Task: After the course BS part 1 5 business team were composited that applied its new knowledge and developed their business models using the business model canvas and well as the NABC matrix (Needs - Approach - Benefits - Competitors), both on-site and later on after the workshop as "homework". This plan was submitted to and reviewed and commented on by Nadine Schmieder-Galfe. The teams has to implement the feedback and prepare a presentation of their Business Plan for the workshop in Turku (FI), September 2019. Completion of Business Course part 1 was accredited with 1 ECTs. For the composition and the basic ideas of each of the team, see Table 1. For the resulting canvases, see Deliverable 1.5.

Table 1. Overview of business teams.

Business Team Name	Members	Description of idea
Telecan	**Giorgia Demaria**; Allison Loiselle; Anna Neustaeter; **Iris Tigchelaar**; **Philip Wagstaff**	A mobile screening program for rural and remote first nations communities in Ontario, Canada.
INCRANE "passion for pressure "	Sina Engler; **Jacqueline van den Bosch; Jeferson da Silva; Vincenzo Pennisi**	A non-invasive device that can give a relative or an absolute value of intracranial pressure, or the translaminar pressure gradient
Eye Analysis	Tuomas Heikka; Azzurra Invernizzi; **Konstantinos Papellis; Daniel Asfaw**	The final product will be a multi-sided platform that can provide online, fast and unbiased ophthalmic screening.
4Stroke	**Shereif Haykal; Khaldoon Al-Nosiary; Valeria Lo Faro; Gokulraj Prabhakaran; Rijul Soans**	A machine learning algorithm for detecting early CT changes in stroke patients and an online platform where CT scans of suspected stroke patients can be uploaded and screened using the built algorithm.
Fleximetry	Catarina Joao; Lorenzo Scanferla; Asterios Crysou; **Sandra Gonzalez-Torrecilla;** Nigus Asefa; Birte Gestefeld	Better, faster, and easier visual field testing tool

Business Start-up Part 2

September 12th, 2019 - During Workshop 7 (Turku, FI)

EGRET's second Business Start-up course was organised by EG together with start-up company Ocuspecto Oy. During this second workshop, all participants presented their business models based on the canvas they had worked on and improved in the meantime and received feedback. After the presentations, only participants who had decided to choose for the business path learned how strategically decide to go either for a spin-off or a licensing model and were introduced to basic funding models, incl. The do's and don'ts when raising venture capital investments. Moreover, they learned how to write a business plan and how to present a business idea towards a business-centered audience in a pitch format. Surprisingly, many students that had chosen for the grant writing track were also interested in the business knowledge and stayed for the whole workshop although it was not mandatory for them.

The employees at Ocuspecto have seen a lot of happening during the journey of Ocusweep device and service from an idea to CE-marked medical device and conquering (or trying to) the markets in Finland and foreign countries. In order to encourage and train the ESRs in pitching their ideas they were asked to present their business plans to the employees of Ocuspecto over dinner as an informal person to person dinner talk.

During the workshop also visit to premises of Ocuspecto and the product line of Mariachi factory (manufacturer of Ocusweep device) was organized. Chairman of the Mariachi board Jukka Järvi-Laturi presented their unique Kasvattamo program for start-ups and inventors, aimed at helping innovations to reach the market faster and with greater success. Ocuspecto company is a product of that program.

Professor Mikko Hupa, former rector of Åbo Akademi University in Turku, gave a talk about "Research and innovation in the university" showing examples of how research ideas in Åbo Akademi have been analyzed and chosen for further development to business ideas. He stressed the importance of good and detailed agreements between research institutes, universities, and commercial partners already in the early steps of the innovation.

Task: After the course BS part 2, those ESRs that decided to complete the course had write a full business plan (individually or with their team members). This application has again been reviewed Nadine Schmieder-Galfe and feedback was provided by mail.

Completion of Business Course part 2 was accredited with 1 ECTs. **Note:** fellows were obliged to either complete the Business Start-up part 2 or the Grant Writing Part 2 (or do both), as part of their EGRET+ training obligations.

Business Plan pitching

December 11th, 2019 - During Workshop 8 (Groningen, NL)

Three business teams decided to take the opportunity to pitch their Business Plan in front of a multi-facetted panel. More information on the three teams (Telecan, BrainMate and Fleximetry) is shown in the table below.

Table 2. Business Plan teams and short description.

Team name	**Telecan**	**BrainMate**	**Fleximetry**
Business Idea Description	Mobile based screening and teleophthalmology program for the First Nations people in rural Ontario, Canada	Novel device for non-invasive and fast intracranial pressure measurement and monitoring	Software tools to identify visual field defects based on eye movement data
Team members	Allison Loiselle Iris Tigchelaar Giorgia Demaria	Sina Engler Jacqueline van den Bosch Jeferson da Silva Vincenzo Pennisi	Catarina A. Rodrigues Joao Lorenzo Scanferle Birte Gestefeld

The panel members were: Nadine Schmieder Galfe (trainer Business Start-up course), Alessandro Grillini (former participant of the course, founder of Reperio), Hans Hektor (Business Developer UMCG), Ronald Hesse (Innovation Consultant, Triade UMCG). Of each team, 1 member gave a 3 minute pitch after which the panel had time (~7 min.) to ask targeted questions about the business plan. Furthermore, feedback has been provided on the quality of the pitches. After pitches, the panel evaluated each of the plans based on its feasibility.

As a result, two of the three business plans were evaluated as very good and recommended support for further feasibility testing. Specifically, Telecan and BrainMate received money to fund (up to a certain limit) the travel costs for a 1-week Canadian trip to Toronto for stakeholder network development and IP and grant

consultation consultation, respectively. All three teams were brought in contact with the relevant accelerator programme to further work on their business ideas, gain more business knowledge, and have access to relevant new networks.

Skill Module 2: Grant Writing

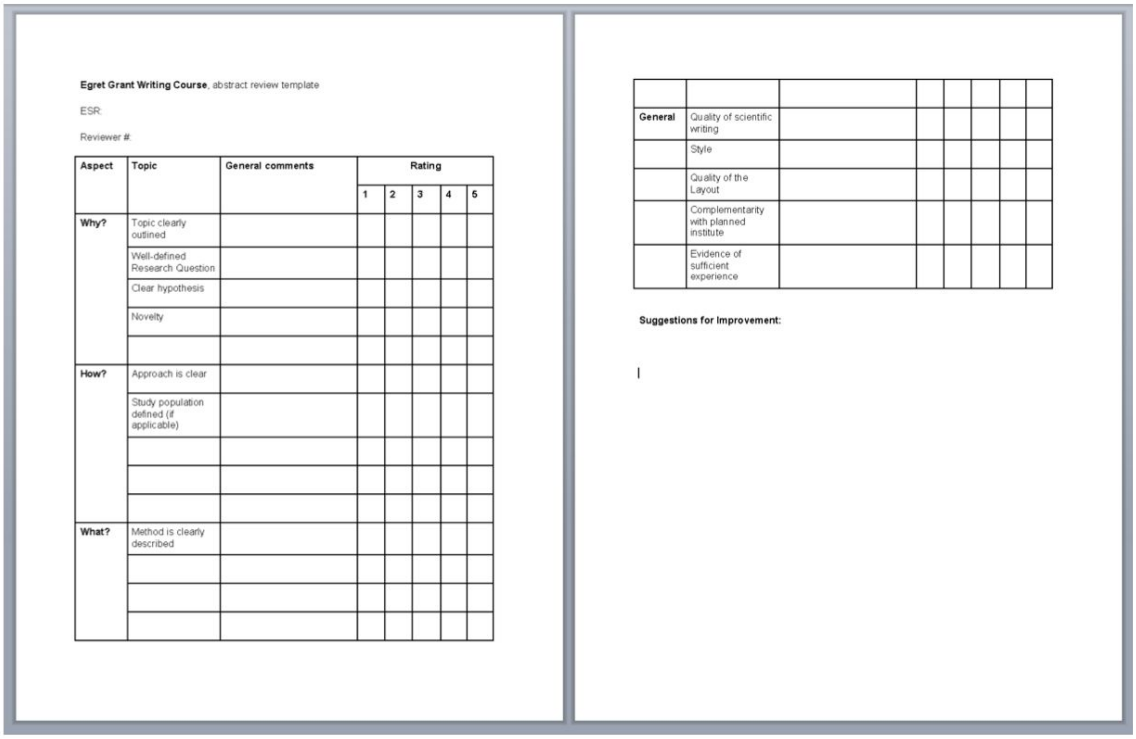
Grant Writing part 1a

November 21st, 2018 - During Workshop 5 (Groningen, NL)

The grant writing course was organized by the Training Coordinator in collaboration with UMCG's "Research BV", the support office of the UMCG, providing grant application support.
During the Grant Writing Part 1a, Prof. Frans Cornelissen gave an introductory lecture about Grant Writing. Specifically, he discussed the three essential questions to ask when writing a Grant Application (Why? How? What?), and shared some personal tips and experiences. Cornelissen also introduced the application abstract and how it should be structured. Furthermore, there was a guest-lecture by Marie-Jose van Tol (Assistant Professor), who shared her grant application failures and successes, doubts, struggles and tips. She also addressed the importance of the abstract of the application and concluded with her golden advice: never give up!

Task: Following Part 1 of the course, each of the ESRs had to write a summary (max 1 page) for a Grant Application. In this summary the fellows had to discuss all (relevant) why's and how's. The abstracts were reviewed by the PIs using a structured form (see figure below) and the individual feedback was provided during the Grant Writing part 2, in Clermont Ferrand (F).

Review score form



Egret Grant Writing Course, abstract review template

ESR:

Reviewer #:

Aspect	Topic	General comments	Rating				
			1	2	3	4	5
Why?	Topic clearly outlined						
	Well-defined Research Question						
	Clear hypothesis						
	Novelty						
How?	Approach is clear						
	Study population defined (if applicable)						
What?	Method is clearly described						

General	Quality of scientific writing						
	Style						
	Quality of the Layout						
	Complementarity with planned institute						
	Evidence of sufficient experience						

Suggestions for Improvement:

Grant Writing part 1b

April 2nd, 2019 - During Workshop 6 (Clermont Ferrand, F)

Mélanie Rigal and Vanessa Tixier (UCA European Affairs Office) gave a talk on “Grant Application, Skills, and Pitfalls: feedback on ESR abstracts”. It described the activities of the office, and addressed topics such as “What makes a good proposal”, “the importance of following the guidelines, and good and bad examples of titles, acronyms, Explaining the value of research in plain language, organizing the proposal into topics,

Frans Cornelissen gave a presentation informing about the main comments given on the grant application abstracts. He summarized some of the most frequently made comments concerning the clarity, the specificity, the credibility and the style. Moreover, because they were writing a personal grant, they should pay more attention as to why the writer is the best person to undertake the work, and also why the planned institute is the best one possible. In addition, he presented the instructions that were compiled by UMCG’s research office: “Research BV: (slightly adapted) version of MC individual

fellowship". These served as instructions for the second and follow-up part of this course, in which ESRs would write a full grant proposal.

Task: Completion of Grant Writing part 1 was accredited with 1 ECTs. Following Part 1b of the Grant Writing course, each of the ESRs chose whether he/she wanted to continue with part 2 or not. In case of a continuation, the ESRs wrote e a Marie-Curie Individual Fellowship application. This application has been reviewed by the Research BV and by a peer-fellow. Individual feedback was provided by mail. **Note:** fellows were obliged to either participate in Grant Writing Part 2 or in the Business Start-up part 2 (or do both).

Grant Writing part 2

September 10th, 2019 - During Workshop 7 (Turku, FI)

Frans Cornelissen addressed questions of the ESR regarding the grant writing such as "how to write a CV in less than 3 pages?". Moreover, he presented a summary of the evaluation of the first stage of the full Grant Applications. Main points of improvement concerned "how to guide the reviewer", "using figures to explain your ideas", the need to be specific in your claims rather than general, adapting your proposal to a specific call, what information to put in what section". Moreover, some tricks and tips from former applicants were given. Part of the course concerned also "presenting yourself as best as possible candidate" by optimizing your CV. As part of this, we included a "challenge": describe your "professional self" in one or two lines and a maximum of 20 words. For example "I am a biologist with a passion for visual neuroscientist interested in solving pressing questions for visually impaired patients".

Task: Based on the individual feedback provided and the general feedback and knowledge obtained during part 2 of the course, the fellows were allowed to update their proposals. Furthermore, the fellows had the opportunity to prepare Grant Application Pitch for the last meeting in Groningen, November 2019. Completion of Grant Writing part 2 was accredited with 1 ECTs.

Grant Application pitching

December 10th, 2019 - During Workshop 8 (Groningen, NL)

Three fellows decided to take the opportunity to pitch their application in front of a multi-facetted panel. The panel members were: prof. Nomdo Jansonius, Ritsert Janssen (Dean Talent Development), Heidi Disler (Training and Coach Talent

Development, expertise Grant Writing), Sebastiaan Mathot (Assistant Professor Psychologie, received Marie-Curie individual fellowship + VENI), and Steph Johnson - Zawadski (Ph.D student Environmental Psychology, 1st place Ph.D student project pitch). Each of the fellows gave a 3 minute pitch after which the panel had time (~7 min.) to ask targeted questions about the research proposal. Furthermore, feedback has been provided on the quality of the pitches. After pitches, the panel evaluated each of the proposals based on its feasibility.

The writers of the proposals judged to be eligible for continuation received the option to follow a course of their own choice for further improving their skills and proposal, funded by EGRET-plus money. They received a certificate to award this participation.

Skill Module 3: Scientific Communication and Outreach

March 5th, 2017 - During Workshop 2 (Magdeburg, DE)

The course was given by Professor Bach (Univ. Freiburg), who highlighted important concepts and tools for efficient scientific communication and outreach. Beyond providing examples for increasing the ESRs visibility in the scientific arena, the course comprised the recommendation of tools for efficient scientific presentations and paper writing, e.g. the use citation managers, the optimization of graphics for outreach activities. After the presentation of these topics, the ESRs took the opportunity to discuss these topics with Prof. Bach and the other PIs.

Skill Module 4: Project and Time Management

November 23th, 2016 - During Workshop 1 (Groningen, NL)

This course was based on a successful local course offered by the graduate school of Behavioural and Cognitive Neurosciences of the University of Groningen. It was given by Sonya Pyott and Jan Bernard Marsman, two experienced local teachers in this course. Topics address concerned “setting priorities”, “time management”, “using a to-do-list”, “quality versus time invested”, “effective communication” and “intercultural differences in communication”.

Skill Module 5: Career Planning

Session 1: “Life after the PhD”

March 28th, 2018 - During Workshop 4 (London, UK)

As part of the workshop we invited Dr Giovanni Ometto (Postdoctoral Research Fellow, City University London) , Dr Tamsin Callaghan (Lecturer, City University London) and Dr Luke Saunders (Data Scientist, Open Health UK) to discuss their experiences of the

careers just after they received their respective PhDs. In particular, they discussed the advantages and disadvantages of continuing careers in academia and industry. This also involved a lively question and answer discussion session with the ESRs.

Session 2: “My future career”

November 20th, 2018 - During Workshop 5 (Groningen, NL)

As part of the Career Planning Skill Module, we invited Fransis Bosch (talent trainer and coach of the Talent Career Center, www.talentcareercenter.nl) who gave a half-a-day course on “My future career”. During this course, the fellows were actively stimulated to start thinking about their future careers: What do I want? This is not a question that can be completely answered after just one morning session. Yet, through different types of exercises, the fellow should have started thinking about or even formulating an answer to: “What fits me best: career in academia or industry?”. Furthermore, skill related questions such as “How do I transfer my skills learned during my Ph.D to other fields?” have been discussed.