Position for Early Stage Researcher (36 months)

SwitchBoard is an Innovative Training Network (ITN) funded by the European Commission's Horizon 2020 program under the Marie Curie Actions, comprising 11 European Universities, research institutions and companies, coordinated by Eberhard Karls Universität Tübingen, Germany. The duration of the project, entitled “In the eye of the observer: Visual processing at the heart of the retina”, is 48 months, starting on November 01, 2015. The network will progressively open a total of 15 (3 year) full-time positions for PhD training.

Project Title
Information flow in bipolar cells: from the photoreceptors to the retina’s “switch board”

Project description
The space, time and wavelength content of natural scenes show strong correlations. When the information flows from photoreceptors to BCs and horizontal cells (HCs), signals are de-correlated and information redundancies are reduced\textsuperscript{1,2}. Each BC type is assumed to process a separate information stream. It is an open question whether similar or distinct processes (e.g. via HC input) are used to modulate the inputs to the various BC types. In this project we aim to quantify the information content of the various BC types in the spectral, spatial and temporal domains. If the retina had optimized the use of bandwidth of the BC “cable” then the performances of all BC pathways should be similar. If, however, BCs are reserved for specialized tasks then these BCs should strongly differ in their performance levels.

Methods
Whole-cell patch-clamp recordings of photoreceptors, horizontal cells and bipolar cells. Dye injections will be used to identify the recorded cells. Various light stimulation protocols, including natural scenes will be used to probe the properties of the various neurons. Experiments will be performed on a variety of mutant zebrafish with mutations in proteins essential in the cone/horizontal cell/bipolar cell synapse. CRISPR/Cas9 technology will be applied to generate novel mutants during the project.

Team
The group of Prof. dr. Maarten Kamermans, The Retinal Signal Processing lab, focuses on how cellular processes and synaptic interactions in the retina shape the retinal neural code. It explores the visual

sensory system using a highly multidisciplinary approach with often a strong quantitative signature. The lab is fully staffed and equipped for this broad approach, ranging from molecular biology/morphology to single cell electrophysiology/vital (2p)-imaging and behavior. Zebrafish, mice, and cultured human retinas are used in the lab. The lab consists at present of 3 postdocs, 3 graduate-, 2 undergraduate students and a technician. There are 2 open slots of graduate students. The supervision of the graduate student will be done by Maarten Kamermans. Technical assistance will be given by the technician.

The retinal Signal Processing lab is located in the Netherlands Institute for Neuroscience. The Netherlands Institute for Neuroscience is a prestigious research institute of the Royal Netherlands Academy for Arts and Sciences (KNAW) and offers a stimulating inter-disciplinary scientific environment with excellent research facilities, located next to the Amsterdam Medical Centre (AMC) in Amsterdam, the Netherlands.

**Candidate profile**
We are looking for an excellent, independent and highly motivated candidate with a MSc or equivalent degree in biology, biotechnology, medicine, pharmacy, or a related discipline. The candidate should have extensive experience with in vitro electrophysiology. A strong background in retinal physiology and systems analysis is an advantage. Demonstrated written and spoken English proficiency, good communication skills, publications and a proven track record are considered important.

**Envisaged JOB STARTING DATE**
March 2016 or earlier

**How to apply & Contact**
Please send your application including curriculum vitae and two letters of reference to: m.kamermans@nin.knaw.nl. Please use “SwitchBoard Job Vacancy ERS 7” in the e-mail subject heading.

Additional Information can be found at: www.etn-switchBoard.eu/ and at: www.herseninstituut.knaw.nl/ResearchGroups/kamermansGroup.

Evaluation of candidates will begin immediately and will continue until the opening is filled.

**Eligibility Criteria**
The EU has strict eligibility criteria for Early Stage Researchers: Candidates
- must not have resided or carried out their main activity in the country of the host institution for more than 12 months in the 3 years immediately prior to their recruitment.
- should not possess a PhD
- should have less than 4 years of research experience. This is measured from the date when they obtained the degree which formally entitles them to embark on a doctorate, either in the country in which the degree was obtained or in the country in which the research training is provided.