<table>
<tr><td colspan="6">Course Title: Quantitative Microscopy</td></tr>
<tr><td colspan="2">Module Identification-Nr.
M-Neuro-AM15 a-b</td><td>Workload
180 h</td><td>Credit Points
6</td><td>Frequency of Occurrence
WS/SS</td><td>Duration
One Semester</td></tr>
<tr><td>1</td><td>Type of lessons
a) Lecture
b) Practice
c) Seminar</td><td colspan="2">Contact time
a) 7 h
b) 65 h
c) 8 h</td><td>Self-study time
100 h Preparation and follow-up, L, P, S, preparation of the final poster presentation</td><td>Planned group size
a) 4 max
b) 4 max
c) 4 max</td></tr>
<tr><td>2</td><td colspan="5">Aims of the module
The students should get an overview of current microscopy methods. They should have learned the basic skills to perform simple immunocytochemical analyses. They should learn the basics of quantifying the resulting cellular data. Last but not least, they should understand the basics of cellular pain research based on the application example.</td></tr>
<tr><td>3</td><td colspan="5">Contents of the module
• Theory of transmitted and reflected light microscopy with focus on immunepifluorescence, confocal, High Content Screening (HCS), Total Internal Reflection (TIRF) and STED microscopy methods
• Primary cell culture: preparation, dissociation and cultivation of primary tissue (rats/mouse spinal ganglion neurons)
• secondary cell culture: HEK293 cells, splitting, transfecting
• immunofluorescence staining
• Experimentator-based intensity evaluation
• Computer-based image analysis (object recognition, background correction, intensity comparison, problem of threshold determination to distinguish between "marker-positive" and "marker-negative" populations)
• Working with the image processing and image analysis software ImageJ
• Quantitative analysis at the High Content Screening Microscope
• HCS microscopy in cellular pain research
• Creation and presentation of a scientific results poster</td></tr>
<tr><td>4</td><td colspan="5">Teaching methods
Lectures, practical, seminars</td></tr>
<tr><td>5</td><td colspan="5">Requirements for participation

Formal: Enrollment in the Master’s program “Experimental and Clinical Neurosciences” at the University of Cologne

Content: None</td></tr>
<tr><td>6</td><td colspan="5">Type of module examination

The final examination consists of a results poster presentation. The resulting discussion will be evaluated.</td></tr>
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7	**Prerequisites for awarding credit points** Regular and active participation
8	**Use of the module** (in other courses) None
9	**Significance of the module mark for the overall grade** In the Master's program "Experimental and Clinical Neurosciences": 6% of the overall grade ((see also appendix of the examination regulations)
10	**Modul representative and full time teacher** **Module representative:** Prof. Dr. T. Hucho, 478 97760, tim.hucho@uk-koeln.de **Full-time teachers:** Prof. Dr. Tim Hucho, Dr. Jörg Isensee
11	**Other information:** **Literature:**