

## MultiPark A11 Confocal Microscope

Managers: Gunnar Gouras (PI)/Bengt Mattsson (technical manager]

**1. Short description of the infrastructure.**

This first MultiPark-purchased confocal was awarded to GK Gouras in 2012. Bengt Mattsson from the Regenerative Neurobiology group has been the technical manager of this confocal and takes care of training and oversight. This Leica SP8 confocal is intended for imaging of fixed tissue and cells. This inverted confocal includes a motorized stage and a two channel confocal scanning head with spectral detection. The system has 3 LED lasers with these laser lines: 405, 488, 514, 552 and 638 nm and two detectors of which one is a standard detector and one is a HyD SP detector.

**2. Is this infrastructure receiving support also from other Strategic Research Areas (SRAs) or organizations at Lund University (e.g. Medical faculty, LBIC). If yes, please specify the type of support and its amount.**

User fees have supported the service contracts. MultiPark provides rent for one third of the room for this confocal.

**3. Number and names of MultiPark senior researchers using the infrastructure in the period 2018-2020<sup>1</sup>.**

13 senior researchers:

Maria Swanberg, Oxana Klementieva, Andi Heuer, Daniella Ottosson, Oskar Hansson, Cecilia Lundberg, Laurent Roybon, Gesine Paul-Visse, Anders Björklund, Johan Jakobsson, Tomas Björklund, Malin Parmar, Gunnar Gouras

**4. Number and names of senior researchers outside of Multipark and/or non-academic partners using the infrastructure 2018-2020.**

None.

**5. Does the infrastructure have a steering document accessible to the users? If yes, when was it last updated?<sup>2</sup>**

Steering document is attached. Adapted from the last update in June 2018.

**6. Is the infrastructure charging user fees? If yes, state the amount and what is covered by the user fees.**

Yes, 7000 SEK for initial ca. 7 hours of training and then 250 SEK/hr MultiPark users and 800 SEK/hr for non-MultiPark users.

**7. List publications generated with the help of this infrastructure during the past 3 years (2018-2020). Do not include manuscripts in preparation and please give the full reference (i.e., complete author list, complete title, journal name with year, volume, pages)<sup>3</sup>.**

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<sup>1</sup> If the infrastructure was first established in 2020, please include this information.

<sup>2</sup> Note that the Multipark leadership may ask to see this document with a very short notice.

<sup>3</sup> If the infrastructure was first established in 2020, please include this information here too.

- Olsson TT, Klementieva O, Gouras GK. Prion-like seeding and nucleation of intracellular amyloid- $\beta$ . *Neurobiol Dis.* 2018 Jan 29;113:1-10.
- Pircs K, Petri R, Madsen S, Brattås PL, Vuono R, Ottosson DR, St-Amour I, Hersbach BA, Matusiak-Brückner M, Lundh SH, Petersén Å, Déglon N, Hébert SS, Parmar M, Barker RA, Jakobsson J. Huntingtin Aggregation Impairs Autophagy, Leading to Argonaute-2 Accumulation and Global MicroRNA Dysregulation. *Cell Rep.* 2018 Aug 7;24(6):1397-1406.
- Cardoso T, Adler AF, Mattsson B, Hoban DB, Nolbrant S, Wahlestedt JN, Kirkeby A, Grealish S, Björklund A, Parmar M. Target-specific forebrain projections and appropriate synaptic inputs of hESC-derived dopamine neurons grafted to the midbrain of parkinsonian rats. *J Comp Neurol.* 2018 Sep 1;526(13):2133-2146.
- Jewett M, Dickson E, Brodin K, Negrini M, Jimenez-Ferrer I, Swanberg M. Glutathione S-Transferase Alpha 4 Prevents Dopamine Neurodegeneration in a Rat Alpha-Synuclein Model of Parkinson's Disease. *Front Neurol.* 2018 Apr 6;9:222.
- Martinsson I, Capetillo-Zarate E, Faideau M, Willén K, Esteras N, Frykman S, Tjernberg LO, Gouras GK. APP depletion alters selective pre- and post-synaptic proteins. *Mol Cell Neurosci.* 2019 Mar;95:86-95.
- Aso E, Martinsson I, Appelhans D, Effenberg C, Benseny-Cases N, Cladera J, Gouras G, Ferrer I, Klementieva O. Poly(propylene imine) dendrimers with histidine-maltose shell as novel type of nanoparticles for synapse and memory protection. *Nanomedicine.* 2019 Apr;17:198-209.
- Roth M, Gaceb A, Enström A, Padel T, Genové G, Özen I, Paul G. Regulator of G-protein signaling 5 regulates the shift from perivascular to parenchymal pericytes in the chronic phase after stroke. *FASEB J.* 2019 Aug;33(8):8990-8998.
- Adler AF, Cardoso T, Nolbrant S, Mattsson B, Hoban DB, Jarl U, Wahlestedt JN, Grealish S, Björklund A, Parmar M. hESC-Derived Dopaminergic Transplants Integrate into Basal Ganglia Circuitry in a Preclinical Model of Parkinson's Disease. *Cell Rep.* 2019 Sep 24;28(13):3462-3473.e5.
- Davidsson M, Wang G, Aldrin-Kirk P, Cardoso T, Nolbrant S, Hartnor M, Mudannayake J, Parmar M, Björklund T. A systematic capsid evolution approach performed in vivo for the design of AAV vectors with tailored properties and tropism. *Proc Natl Acad Sci U S A.* 2019 Dec 9;116(52):27053-62
- Klementieva O, Sandt C, Martinsson I, Kansiz M, Gouras GK, Borondics F. Super-Resolution Infrared Imaging of Polymorphic Amyloid Aggregates Directly in Neurons. *Adv Sci (Weinh).* 2020 Feb 7;7(6):1903004.
- Roth M, Enström A, Aghabeick C, Carlsson R, Genové G, Paul G. Parenchymal pericytes are not the major contributor of extracellular matrix in the fibrotic scar after stroke in male mice. *J Neurosci Res.* 2020 May;98(5):826-842.
- Tiklová K, Nolbrant S, Fiorenzano A, Björklund ÅK, Sharma Y, Heuer A, Gillberg L, Hoban DB, Cardoso T, Adler AF, Birtele M, Lundén-Miguel H, Volakakis N, Kirkeby A, Perlmann T, Parmar M. Single cell transcriptomics identifies stem cell-derived graft composition in a model of Parkinson's disease. *Nat Commun.* 2020 May 15;11(1):2434.
- Brattås PL, Hersbach BA, Madsen S, Petri R, Jakobsson J, Pircs K. Impact of differential and time-dependent autophagy activation on therapeutic efficacy in a model of Huntington disease. *Autophagy.* 2020 May 6:1-14.
- Hoban DB, Shrigley S, Mattsson B, Breger LS, Jarl U, Cardoso T, Nelander Wahlestedt J, Luk KC, Björklund A, Parmar M. Impact of  $\alpha$ -synuclein pathology on transplanted hESC-derived dopaminergic neurons in a humanized  $\alpha$ -synuclein rat model of PD. *Proc Natl Acad Sci U S A.* 2020 Jun 30;117(26):15209-15220.

- Pomeshchik Y, Klementieva O, Gil J, Martinsson I, Hansen MG, de Vries T, Sancho-Balsells A, Russ K, Savchenko E, Collin A, Vaz AR, Bagnoli S, Nacmias B, Rampon C, Sorbi S, Brites D, Marko-Varga G, Kokaia Z, Rezeli M, Gouras GK, Roybon L. Human iPSC-Derived Hippocampal Spheroids: An Innovative Tool for Stratifying Alzheimer Disease Patient-Specific Cellular Phenotypes and Developing Therapies. *Stem Cell Reports*. 2020 Jul 14;15(1):256-273.