In Vivo platform – rat node

Malin Parmar

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

   The rat node of the MuPa Behavoural platform offers setups for motor and cognitive testing in animal models of neurodegenerative disease. It consists of multiple laboratories and equipment to do comprehensive batteries of motor and cognitive tests in rat with dedicated rooms also for immune-deficient rats. The platform is located in an environment that is very close to state-of-the-art laboratory facilities for stereotaxic surgery, in vivo monitoring of transmitter release, and positron emission tomography and magnetic resonance imaging of small animals

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.**

   No

3. **Number and names of MultiPark senior researchers using the infrastructure in the period 2018-2020[1].**
   Tomas Björklund
   Angela Cencci-Nilsson
   Agnete Kirkeby
   Cecilia Lundberg
   Malin Parmar
   Maria Swanberg
   Anreas Heuer
   Karsten Raucher
   Tadeuz Wieloch
   Niklas Marklund
   Christian Hansen

4. **Number and names of senior researchers outside of Multipark and/or non-academic partners using the infrastructure 2018-2020.**
   My Andersson, Merab Kokaia – Lund Epilepsy Center
   Zaal Kokaia – Lund Stem Cell Center

[1] If the infrastructure was first established in 2020, please include this information.

5. **Does the infrastructure have a steering document accessible to the users? If yes, when was it last updated?[2]**
   Yes, It is updated on an annual basis after a PI meeting. The last meeting was in Dec 2020 and the updated document is for 2021

6. **Is the infrastructure charging user fees? If yes, state the amount and what is covered by the user fees.**
   Yes. Each PI pays an annual fee. For 2021 the annual fee is 10 000 SEK. The remaining cost is divided bi-annually according to usage.

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)[3].**

   MuPa PIs in bold

   Itzia Jimenez-Ferrer, Michael Jewett, Alfredo Dueñas-Rey, Filip Bäckström, Antonio Boza-Serrano, Kelvin C. Luk, **Tomas Deierborg** and **Maria Swanberg**
   The MHC class II transactivator modulates seeded alpha-synuclein pathology and dopaminergic neurodegeneration in an in vivo rat model of Parkinson's disease
   Brain Behav Immun 2021.

   Hoban DB, Shrigley S, Mattsson B, Breger LS, Jarl U, Cardoso T, Nelander Wahlestedt J, Luk KC, **Björklund A**, **Parmar M**.
   Impact of α-synuclein pathology on transplanted hESC-derived dopaminergic neurons in a humanized α-synuclein rat model of PD. Proceedings of the National Academy of Sciences (PNAS) 2020

   Shrigley S, Nilsson F, Mattsson B, Fiorenzano A, Mudannayake J, Bruzelius A, **Ottosson DR, Björklund A**, Hoban DB, **Parmar M**
   Grafts Derived from an α-Synuclein Triplication Patient Mediate Functional Recovery but Develop Disease-Associated Pathology in the 6-OHDA Model of Parkinson's Disease
   Journal of Parkinson's Disease, 2020

   AAV Production Everywhere: A Simple, Fast, and Reliable Protocol for In-house AAV Vector Production Based on Chloroform Extraction.
   Negrini M, Wang G, **Heuer A**, **Björklund T**, Davidsson M.
   Curr Protoc Neurosci. 2020 Sep;93(1)

   *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 Nature Communications 2020

   Davidsson M, Negrini M, Hauser S, Svanbergsson A, Lockowandt M, Tomasello G, Manfredsson FP, **Heuer A:**
   Scientific Reports, 2020

[2] Note that the Multipark leadership may ask to see this document with a very short notice.

[3] If the infrastructure was first established in 2020, please include this information here too.

Quintino L, Avallone M, Brännstrom E, Kavanagh P, Lockowandt M, Garcia Jareño P, Breger LS**, Lundberg C**. GDNF-mediated rescue of the nigrostriatal system depends on the degree of degeneration.
Gene Ther. 2019 Feb;26(1-2):57-64.

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

Espa E, Clemensson EKH, Luk KC, **Heuer A, Björklund T, Cenci MA**.
Seeding of protein aggregation causes cognitive impairment in rat model of cortical synucleinopathy.
Mov Disord. 2019 Nov;34(11)

Adler A*, Cardoso T*, Nolbrant S, Mattsson S, Hoban D, Jarl U, Nelander Wahlestedt J, Grealish S, **Björklund A, Parmar M**. hESC-derived dopaminergic transplants integrate into basal ganglia circuitry in a preclinical model of Parkinson´s disease. Cell Reports 2019

Rosenblad C, Li Q, Pioli EY, Dovero S, Antunes AS, Agúndez L, Bardelli M, Linden RM, Henckaerts E, **Björklund A**, Bezard E, **Björklund T**.
Vector-mediated l-3,4-dihydroxyphenylalanine delivery reverses motor impairments in a primate model of Parkinson's disease.
Brain. 2019 Aug 1

Michael Jewett, Elna Dickson, Kajsa Brolin, Matilde Negrini, Itzia Jimenez-Ferrer and **Maria Swanberg**
Gsta4 Prevents Dopamine Neurodegeneration in a Rat Alpha-Synuclein Model of Parkinson's disease
Front Neurol. 2018 Apr 6; 9:222

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 Neurology, 2018

Quintino L, Namislo A, Davidsson M, Breger LS, Kavanagh P, Avallone M, Elgstrand-Wettergren E, Isaksson C, **Lundberg C**. Destabilizing Domains Enable Long-Term and Inert Regulation of GDNF Expression in the Brain.
Mol Ther Methods Clin Dev. 2018 Sep 4

Tordo J, O'Leary C, Antunes ASLM, Palomar N, Aldrin-Kirk P, Basche M, Bennett A, D'Souza Z, Gleitz H, Godwin A, Holley RJ, Parker H, Liao AY, Rouse P, Youshani AS, Dridi L, Martins C, Levade T, Stacey KB, Davis DM, Dyer A, Clément N, **Björklund T**, Ali RR, Agbandje-McKenna M, Rahim AA, Pshezhetsky A, Waddington SN, Linden RM, Bigger BW, Henckaerts E.

A novel adeno-associated virus capsid with enhanced neurotropism corrects a lysosomal transmembrane enzyme deficiency.
Brain. 2018 Jul 1

Davidsson M, Díaz-Fernández P, Torroba M, Schwich OD, Aldrin-Kirk P, Quintino L, **Heuer** A, Wang G, **Lundberg C**, **Björklund T**.
Molecular barcoding of viral vectors enables mapping and optimization of mRNA trans-splicing.
RNA. 2018 May;24(5):673-687. doi: 10.1261/rna.063925.117. Epub 2018 Jan 31

Aldrin-Kirk P, **Heuer A, Rylander Ottosson** D, Davidsson M, Mattsson B, **Björklund T.**
Chemogenetic modulation of cholinergic interneurons reveals their regulating role on the direct and indirect output pathways from the striatum.
Neurobiol Dis. 2018 Jan;