Postdoc Position in BrainDrugs WP3: Neuroimaging in depression

A postdoc position is now available at BrainDrugs (https://braindrugs.nru.dk), at the Neurobiology Research Unit (NRU), Copenhagen University Hospital, Rigshospitalet.
The expected starting date is **1st December 2020**, or soon thereafter. The position is available for 2 years.

There is currently an enormous unmet need for the development of effective precision medicine approaches for mood disorders. More precise prediction of risk and resilience as well as more precise treatment strategies are needed to replace the present "one-size-fits-all" and subsequent "trial-and-error" approach to prevention and treatment currently applied in our patients.
An important step to achieve this goal is to uncover endophenotypes and biomarkers that characterize risk and resilience and can critically help to stratify patient cohorts in terms of predicting treatment outcomes longer-term.

The postdoc will analyse neuroimaging and related data from large existing cohorts of healthy individuals, individuals at familial risk of mood disorders and patients with mood disorders that include structural and functional MRI (resting state and task-based fMRI), molecular brain imaging with Positron Emission Tomography (PET), neuropsychological test performance (emotional and non-emotional cognition) and blood tests and combine these with register-based follow-up data on brain health status and level of functioning. Follow-up time will vary between 2 and 20 years.
The existing cohorts which will be available to the postdoc contain rich deep phenotyping data from a large number of healthy controls which serve as an important reference for our patient studies. They also uniquely enable us to conduct register-based follow-up studies to establish which features in clinically healthy individuals can predict later development of depressive episodes or related disorders; information which can be extracted from the national registries.

Within WP3 of the BrainDrugs project, we will investigate the following questions:
1. What are the patterns of molecular-, structural- and functional brain network markers in healthy individuals that predict depressive episodes?
2. What are the features in at-risk/ remitted individuals predictive of subsequent depressive episodes?
3. What are the features in patients with unipolar depression and bipolar mood disorders which predict longer term outcomes in terms of relapse, level of functioning, shift in diagnoses, etc., and do these outcomes depend on treatment history as defined at baseline and through register-based information.

BrainDrugs is headed by Professor, DMSc Gitte Moos Knudsen, and WP3 is led by Professor, DMSc, DPhil Kamilla Miskowiak and Associate Clinical Research Professor, PhD, MD Vibe G. Frøkjær. The postdoc will work in collaboration with clinicians, neuroimagers and biostatisticians from the section of Biostatistics of the University of Copenhagen.

Research environment
BrainDrugs is hosted at the Neurobiology Research Unit (NRU), Department of Neurology, Neuroscience Center at Rigshospitalet. NRU encompasses around 50 staff members and has an annual budget of roughly €3.5 million. NRU has extensive experience in organization and governance of large-scale research collaborations, e.g., the Lundbeck Foundation Center for Integrated Molecular Brain Imaging (Cimbi) and Center for Experimental Medicine Neuropharmacology (NeuroPharm). NRU has many national and international collaborators and has expertise in molecular, functional and structural brain imaging in brain disorders.

Qualifications
The candidate must have obtained a PhD degree in Neuroscience, Biostatistics, Engineering or a related relevant discipline. The preferred candidate has:

- Experience with processing and parcellation of neuroimaging data, especially functional magnetic resonance imaging, and acquaintance with quantification of molecular brain imaging data
- A strong background in predictive modeling (e.g. machine learning) and assessment of model performance
- Knowledge in survival analysis, causal inference, or Bayesian modeling is an advantage. Experience with functional connectivity analysis and disease prediction from neuroimaging data
- High programming proficiency in R, MATLAB, Python or C++
- Experience with register-based research and/or neuroimaging
- Insights in mental health
- A publication record in machine learning applied to neuroimaging or register studies

A keen interest in mental health, mood disorders, cognition, and neuroimaging is required as well as willingness to acquire theoretical background in neurotransmission, brain circuit organization, and cognitive neuropsychiatry. Knowledge of the FMRIB Software Library (FSL) and/or Statistical Parametric Mapping (SPM) would be beneficial and a willingness to acquire new analysis tools.
The candidate should have good collaborative skills as well as skills in the realm of verbal and written communication, as evidenced by scientific publications. The candidate must have an international outlook and be able to work independently and proactively. Spoken Danish is not a requirement but advantageous.

Job description
The successful candidate will among other things train machine learning methods to identify biomarkers predictive of a depression episode based on structural and functional neuroimaging data and neuropsychological test data sets as well as psychometrics, patient history, and genetic and peripheral markers of importance for brain function and dysfunction. These data come from several completed studies in healthy individuals, patients with mood disorders and individuals at familial risk. The candidate will also provide support to the BrainDrugs research group. The successful candidate will take a full and active role in the daily life of the BrainDrugs groups, including attending group meetings, educational activities, teaching and supervision of research assistants, participation in

scientific conferences, conceptualization of related research projects, and contributions to grant applications.

Salary and conditions of employment
The terms of employment and salary are in accordance with the agreement between Danish Regions and The Danish Confederation of Professional Associations on Academics in the Regions.

Application
The application shall be submitted in English and include a CV, a short motivation letter (maximum 1 page), a copy of the doctoral certificate or letter signed by the promotor that a doctoral certificate is expected in due time, a publication list, and a maximum number of three scientific publications, at least two of which are international journal articles. Teaching portfolio and references can also be included, if available.
Please note that applications will be assessed based on these mandatory enclosures. Applicants cannot expect any additional documentation to be considered in the assessment.

Application procedure
After the expiry of the deadline for applications, applicants will be selected for interviews.
We wish to encourage everyone interested in this position to apply, regardless of personal background.
For further information, please contact Clinical Research Associate Professor Vibe Frøkjær (email: vibe@nru.dk) or Head of Section Esben Budtz-Jørgensen (email: ebj@sund.ku.dk).
The deadline for applications including enclosures is 9th November 2020 (at midnight 23:59 Danish Time)
Please note: Applications must be submitted and documents must be uploaded online. Press "Apply now" and fill in the application form.
Applications received after deadline will **not** be taken into account.

To apply click on the following link:
https://candidate.hr-manager.net/ApplicationInit.aspx?cid=342&ProjectId=227294&DepartmentId=17200&MediaId=6