Bringing Mental Illness Out of the Shadows

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About Me

- MD and PhD in Molecular Neuroscience
- Honorary Consultant Psychiatrist and Member of Royal College of Psychiatrists
- Professor of Neurotechnology Univ. Cambridge
- Professor of Translational Neuropsychiatry Erasmus Medical Centre, Rotterdam, NL

Key decisions/circumstances

- Funding by **Stanley Medical Research Institute**, USA for 15 years
- Meeting **Chris Lowe** in 2004 and moving into the Institute of Biotechnology
- Ongoing support from **Cambridge Enterprise** and RSD
- Strong **collaborative network**
The Burden of Mental Illness is Enormous
- 10% of world population affected by schizophrenia, bipolar disorder or major depressive disorder
- 24% of total YLD (Years Lived with Disability) in Western World
- >15% of burden of disease in established economies
- Schizophrenia alone costs US$ >> 100B pa (USA and Europe)
- Early intervention greatly improves clinical outcomes
- Early diagnosis is a clear unmet clinical need
Current Diagnosis

- Subjective clinical interview
- Overlap of diagnostic criteria with other related psychiatric disorders
- No means to stratify disease sub-populations
- Only ~30-40% of patients respond to psychiatric medication
- Difficult to diagnose prodromal or first onset patients
- No objective disease biomarkers available
- To aid diagnosis
Estimated Benefits of Early Diagnosis and Treatment in Schizophrenia

<table>
<thead>
<tr>
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<th>Intervention in early symptom phase</th>
<th>Intervention in prodromal phase</th>
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<tbody>
<tr>
<td>Premature deaths</td>
<td>↓ 4.2%</td>
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<tr>
<td>Hospitalisations</td>
<td>↓ 12-25%</td>
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<tr>
<td>Inpatient days</td>
<td>↓ 64%</td>
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<tr>
<td>Relapses</td>
<td>↓ 30-70%</td>
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<td>Time to remission</td>
<td>↓ 74%</td>
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<tr>
<td>Poorer outcomes</td>
<td>↓ 27%</td>
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<tr>
<td>DUP</td>
<td>↓ 88 weeks</td>
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Incidence: ↓ 90%
Conversion to psychosis: ↓ 75%

- Data based on current diagnostic tests
- Comparisons with intervention in established disease phase
- Current diagnostic methods poor
- Broad definition, overlap with other diseases
- Subjective, relies on accurate patient history
- At least 6 months for definitive diagnosis (DSM IV)

Sources: Schizophrenia Research 2005
Disease Management and Health Outcomes 2001
Annals Academy of Medicine 2004
Schizophrenia is a Systemic Disorder

Discovery...

PM
BRAIN
CSF

CSF

LIVER
Spleen
Dura Mater
T-cells
Fibroblasts
Erythrocytes
Whole Blood
Plasma
Serum
Urine

BRAIN

CSF

PERIPHERAL
TISSUES

0.15-0.45mg/ml

60-80mg/ml

10^10

PROTEIN

[BIO MARKER]

SERUM
NON-HYPOTHESIS DRIVEN APPROACH TO BIOMARKER DISCOVERY

LABEL-FREE ‘BOTTOM-UP’ APPROACH

SERUM/PLASMA/BRAIN

EXTRACTION OF PROTEINS

DEPLETION OF ABUNDANT PROTEINS (can mask lower abundance proteins)

DIGESTION

PEPTIDES

TRANSLATION OF CANDIDATES TO RBM PLATFORM

BIOINFORMATICS

NLC-MS/MS

Technology
# PSYNOVA NEUROTECH LTD

**Personalised medicine for neuropsychiatric disorders**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event/Investment Details</th>
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<tbody>
<tr>
<td>2004</td>
<td>PoC Fund (£25,000)</td>
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<tr>
<td>2005</td>
<td>UCCF investment (£250,000) Company founded</td>
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<tr>
<td>2006</td>
<td>VC investment (Porton Capital; £1.25m)</td>
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<td>2007</td>
<td>Medical futures innovation award Partnership with Rules Based Medicine (RBM, Austin, Tx; £1.5m)</td>
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<td>2008</td>
<td>Psynova/RBM identify biomarker panel for schizophrenia</td>
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<td>2009</td>
<td>Product launch: schizophrenia diagnostic Veripsych™</td>
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<tr>
<td>2010</td>
<td>Business weekly: killer 50 company</td>
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<tr>
<td>2011</td>
<td>ACES; Best European Life Science Company</td>
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</table>
2008: Co-development of a new blood-based biomarker test to aid in the diagnosis and treatment of schizophrenia
Anticipated Application Of Biomarker Tests In Psychiatry

- Treatment regime (therapeutic stratification)
- Compliance testing
- Monitor patient response
- Patient stratification
- Susceptibility
- Risk prediction
- Diagnosis
- Prognosis

DISEASE EVOLUTION
Products
June 2011: Myriad Genetics acquires Psynova Neurotech Ltd and RBM Inc for $80M
The Bahn Lab

The Team
The Yacht...