Bringing Mental Illness Out of the Shadows

Prof Sabine Bahn MD PhD MRCPsych
University of Cambridge, UK
Erasmus MC, NL
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**

Intervention in **early symptom phase**

<table>
<thead>
<tr>
<th>Metric</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature deaths</td>
<td>4.2%</td>
</tr>
<tr>
<td>Hospitalisations</td>
<td>12-25%</td>
</tr>
<tr>
<td>Inpatient days</td>
<td>64%</td>
</tr>
<tr>
<td>Relapses</td>
<td>30-70%</td>
</tr>
<tr>
<td>Time to remission</td>
<td>74%</td>
</tr>
<tr>
<td>Poorer outcomes</td>
<td>27%</td>
</tr>
<tr>
<td>DUP</td>
<td>88 weeks</td>
</tr>
</tbody>
</table>

Intervention in **prodromal phase**

<table>
<thead>
<tr>
<th>Metric</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence</td>
<td>90%</td>
</tr>
<tr>
<td>Conversion to psychosis</td>
<td>75%</td>
</tr>
</tbody>
</table>

- 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

PM
BRAIN
CSF

CSF

LIVER
SPLEEN
DURA MATER
T-CELLS
FIBROBLASTS
ERYTHROCYTES
WHOLE BLOOD
PLASMA
SERUM
URINE

PERIPHERAL TISSUES

Discovery...

[BIOMARKER]

[BRAIN]

0.15-0.45mg/ml

[PROTEIN]

10^10

60-80mg/ml

[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
EXISTING DATABASE

DATABASE

Collaborations

250 PRECLINICAL SERUM SAMPLES

250 PRECLINICAL BRAIN SAMPLES

>5000 CLINICAL SERUM SAMPLES

100 PM BRAIN SAMPLES

60 PM PITUITARY SAMPLES
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>PoC Fund (£25,000)</td>
</tr>
</tbody>
</table>
| 2005 | UCCF investment (£250,000)  
Company founded |
| 2006 | VC investment (Porton Capital; £1.25m) |
| 2007 | Medical futures innovation award  
Partnership with Rules Based Medicine (RBM, Austin,Tx; £1.5m) |
| 2008 | Psynova/RBM identify biomarker panel for schizophrenia |
| 2009 | Product launch: schizophrenia diagnostic  
Veripsych™ |
| 2010 | Business weekly: killer 50 company |
| 2011 | ACES; Best European Life Science Company |
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
- Susceptibility
- Risk prediction
- Patient stratification
- Diagnosis
- Prognosis

DISEASE EVOLUTION
VeriPsych™ is the first and only blood test to aid a psychiatrist in the diagnosis of recent-onset schizophrenia. VeriPsych compares the patient’s biomarker profile to that of confirmed schizophrenic patients. It gives physicians, researchers and consumers a new objective evaluation tool. While it is not intended to provide a definitive diagnosis of schizophrenia, or to be used as the sole means of patient treatment, VeriPsych opens a valuable new window into this complicated psychiatric condition.

Latest News

Feb 8 2011
VeriPsych Recognized at European Entrepreneur Awards in Zurich…

Feb 2 2011
VeriPsych Featured in ADVANCE for Medical Laboratory Professionals…
June 2011: Myriad Genetics acquires Psynova Neurotech Ltd and RBM Inc for $80M
The Bahn Lab

The Team

[Images of a group photo and two lab scenes]
The Yacht...