### Provisional Program: Applications to Drug Abuse

<table>
<thead>
<tr>
<th>Day</th>
<th>Topic</th>
<th>Application</th>
<th>Date</th>
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<tbody>
<tr>
<td><strong>Monday</strong></td>
<td><strong>Multivariate Genetic Modeling</strong></td>
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<tr>
<td></td>
<td>Introduction and Welcome</td>
<td></td>
<td>October 22</td>
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<tr>
<td></td>
<td>8:30- 9:00</td>
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<tr>
<td></td>
<td>Statistical Genetics of Substance Use (SU)</td>
<td>Questions Answered and Questions Resolved</td>
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<td>9:00-10:00</td>
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<td></td>
<td>Review 1: R &amp; OpenMx</td>
<td>The Programming Environment</td>
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<td>10:00-10:30</td>
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<td>10:30-11:00</td>
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<td></td>
<td>Review 2: Genetic Factor Analysis</td>
<td>Do different forms of SU have common or specific genetic/ environmental</td>
<td>Maes, Prom</td>
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<td></td>
<td>11:00-12:30</td>
<td>architecture?</td>
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<td>12:30- 1:30</td>
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<td></td>
<td>Direction of Causation</td>
<td>Does smoking cause depression or vice versa?</td>
<td>Gillespie, Verhulst</td>
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<td>1:30- 2:30</td>
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<td>2:30- 3:00</td>
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<td></td>
<td>Comorbidity</td>
<td>Does liability to one disorder increase liability to another, do they share</td>
<td>Neale, Maes</td>
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<td>3:00- 4:00</td>
<td>a common cause, or is a comorbid disorder different from a single disorder?</td>
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<td>4:00- 5:00</td>
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<td></td>
<td>Lab, Questions &amp; Discussion with Faculty</td>
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<td>All Faculty</td>
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<td>5:30- 7:30</td>
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<tr>
<td><strong>Tuesday</strong></td>
<td><strong>Measurement &amp; Phenotyping</strong></td>
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<td>8:00- 9:00</td>
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<td>Medland</td>
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<td></td>
<td>9:00-10:30</td>
<td>Do the items on a scale function similarly at all ages and in both sexes?</td>
<td>Neale, Clark</td>
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<td>10:30-11:00</td>
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<td></td>
<td>11:00-12:30</td>
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<td>Estabrook,Gillespie</td>
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<td>12:30- 1:30</td>
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<td>1:30- 3:00</td>
<td>Are there subgroups with particular patterns of drug use?</td>
<td>Clark, Estabrook</td>
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<td>3:00- 3:30</td>
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<td>3:30- 5:00</td>
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<tr>
<td><strong>Wednesday</strong></td>
<td><strong>Genes, Environment &amp; Development</strong></td>
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<td>8:00- 9:00</td>
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<td>Medland</td>
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<td></td>
<td>9:00-10:30</td>
<td>Do batch effects or clustering affect our analyses?</td>
<td>Mehta, Neale</td>
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<tr>
<td>Time</td>
<td>Topic</td>
<td>Application</td>
<td>Date</td>
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<td>10:30-11:00</td>
<td>Coffee/Tea Break</td>
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<tr>
<td>11:00-12:30</td>
<td>Genetic Growth Models &amp; Time Series (continuous age)</td>
<td>How do we best characterize development of SU?</td>
<td>Gillespie, Verhulst</td>
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<tr>
<td>12:30-1:30</td>
<td>Lunch</td>
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<td>1:30-3:00</td>
<td>Growth Mixture Modeling, Regime Switching</td>
<td>Are there subgroups with different developmental patterns?</td>
<td>Clark, Estabrook</td>
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<td>3:00-3:30</td>
<td>Coffee/Tea Break</td>
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<td>3:30-5:00</td>
<td>Lab, Questions &amp; Discussion with Faculty</td>
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<tr>
<td><strong>Thursday</strong></td>
<td><strong>Family Processes</strong></td>
<td></td>
<td><strong>October 25</strong></td>
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<td>8:00-9:00</td>
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<td>Medland</td>
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<tr>
<td>9:00-10:00</td>
<td>Twin-Family and Extended Pedigrees (non-genetic inheritance, assortment)</td>
<td>Do other sources beside ACE contribute significantly to SU?</td>
<td>Eaves, Maes</td>
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<tr>
<td>10:00-10:30</td>
<td>Sibling &amp; Spousal Interaction</td>
<td>Does one person’s SU directly affect another’s?</td>
<td>Eaves, Neale</td>
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<tr>
<td>11:00-12:30</td>
<td>Nuclear Family, COT, ET</td>
<td>How to estimate genetic and cultural transmission for SU with assortment?</td>
<td>Maes, Eaves</td>
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<td>12:30-1:30</td>
<td>Lunch</td>
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<tr>
<td>1:30-3:00</td>
<td>Sibling Models &amp; Age Difference Moderation</td>
<td>Is sibling similarity for SU greater for sibs close in age?</td>
<td>Verhulst, Medland</td>
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<td>3:00-3:30</td>
<td>Coffee/Tea Break</td>
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<td>3:30-5:00</td>
<td>Lab, Questions &amp; Discussion with Faculty</td>
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<tr>
<td><strong>Friday</strong></td>
<td><strong>GxE Interaction</strong></td>
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<td><strong>October 26</strong></td>
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<td>8:00-9:00</td>
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<td>Medland</td>
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<tr>
<td>9:00-10:30</td>
<td>Genotype Environment Interaction</td>
<td>Is the role of genes the same in all environments? Do our genes affect the choice of environments? Where GxE &amp; rGE goes in ACE models?</td>
<td>Eaves, York</td>
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<td>10:30-11:00</td>
<td>Coffee/Tea Break</td>
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<tr>
<td>11:00-12:30</td>
<td>Measured &amp; Unmeasured GxE Interaction</td>
<td>How to include a measured gene into a twin model?</td>
<td>Bates, Maes, Prom</td>
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<td>12:30-1:30</td>
<td>Lunch</td>
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<tr>
<td>1:30-3:00</td>
<td>Model Limitations</td>
<td>Are genes associated with SU equally distributed across environments?</td>
<td>Eaves, Neale</td>
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<td>3:00-3:30</td>
<td>Coffee/Tea Break</td>
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<td>3:30-5:00</td>
<td>Lab, Questions &amp; Discussion with Faculty</td>
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<tr>
<td>6:00-</td>
<td>Reception in the Cube</td>
<td>1910 Texas Ave, Richmond VA 23220</td>
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### Common Schedule

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<tr>
<th>Time</th>
<th>Activity</th>
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<tr>
<td>8:00-9:00</td>
<td>Optional Review with Sarah Medland (except Monday)</td>
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<tr>
<td>10:30-11:00</td>
<td>Coffee/Tea Break</td>
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<tr>
<td>12:30-1:30</td>
<td>Lunch Break</td>
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<tr>
<td>3:30-3:30</td>
<td>Coffee/Tea Break (on Monday 2:30-3:00)</td>
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<tr>
<td>3:30-5:00</td>
<td>Lab, Questions &amp; Discussion with Faculty (on Monday 4:00-5:00)</td>
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### Special Events

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>5:30-7:30</td>
<td>Monday Reception in Biotech I Atrium</td>
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<tr>
<td>6:00-</td>
<td>Friday Party at Cube</td>
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### Faculty

- **Director**: Michael C. Neale, Professor, Department of Psychiatry  
- **Timothy Bates**, Professor, Department of Psychology, University of Edinburgh  
- **Shauna Clark**, Assistant Professor, Department of Pharmacy  
- **Lindon J. Eaves**, Emeritus Professor, Department of Human and Molecular Genetics  
- **Ryne Estabrook**, Postdoctoral Fellow, NIDA R25: Research Training: Psychiatric and Statistical Genetics  
- **Nathan Gillespie**, Assistant Professor, Department of Psychiatry  
- **Kenneth S. Kendler**, Professor, Department of Psychiatry & Director, Virginia Institute for Psychiatric and Behavioral Genetics  
- **Hermine H. Maes**, Associate Professor, Department of Human and Molecular Genetics  
- **Paras Mehta**, Associate Professor, Clinical Psychology, Industrial Organizational Psychology, University of Houston  
- **Sarah Medland**, ARC Future Fellow, Genetic Epidemiology Laboratory, Queensland Institute for Medical Research  
- **Elizabeth Prom-Wormley**, Research Associate, Department of Human and Molecular Genetics  
- **Brad Verhulst**, Postdoctoral Fellow, NIDA R25: Research Training: Psychiatric and Statistical Genetics  
- **Tim York**, Assistant Professor, Department of Human and Molecular Genetics

### IT Support

- **Joey Noble**, IT Virginia Institute for Psychiatric and Behavioral Genetics

### Admin Support

- **Margaret Phillips**, Virginia Institute for Psychiatric and Behavioral Genetics

### Location

Virginia Institute for Psychiatric and Behavioral Genetics, Virginia Commonwealth University  
Richmond Biotech 1, Robert B. Ball Sr. Conference Room, 800 E Leigh St, Richmond VA 23219

### Sponsor

National Institute on Drug Abuse