Autism Research from an Autism Dad

Kevin Pelphrey
*Autism & Neurodevelopmental Disorders Institute*
Sex differences among people with autism may be minimal

BY LEVI GABBY | 12 APRIL 2017

Estimate of autism’s sex ratio reaches new low

BY SARAH DEWEERDT | 27 APRIL 2017

Temper tantrums up odds of autism diagnosis in girls

BY DAISY YUMES | 9 FEBRUARY 2017

Social activities: Some doctors say that girls with autism are socially more than boys, but science is inconsistent.

Hero Images / Getty Images

Gathering girls: Researchers find more girls with autism when they actively look for them.

WiseeMadi / Getty Images
Problem: Lack of predictive biomarkers perpetuates the status quo of imprecise treatments, wasted time & resources.

Biomarkers should be:
1) grounded in an understanding of basic mechanisms;
2) sensitive, reliable measures of targeted atypical processes at the individual level;
3) predictive of response and informative of mechanism(s);
4) useful as levers to improve treatment response;
5) practical for implementation in a medical setting...

1) Mechanisms of understanding others actions & intentions

Pelphrey et al. (2003) 
Journal of Neuroscience
2) Informative at the level of the individual child

Björnsdotter et al., JAMA: Psychiatry, 2016
**Brain response (beta)**

- AUC = 0.42
- AUC = 0.77
- AUC = 0.83

**Brain response**

- r = -0.43
- r = -0.35
- r = -0.05
- r = 0.26

**Social Responsiveness Scale Score**

- p = .011
- p = .006
- p = .451
- p = .875
- p = .006
- p = .011

Björnsdotter et al., *JAMA: Psychiatry*, 2016
NIH Autism Center of Excellence: Girls Neurogenetics Network
Working Equally Well in Females and Males with ASD?
3) Predictive of Treatment Response & Informative of Mechanism
Pivotal Response Training

- 30 children (4-7 years) receiving PRT; 16 in a wait-list control (WLC)
  - Cross-over design
- 20 typically-developing comparison children
- 4-month treatment course
  - 8 hours per week
  - Direct work with child & parent in clinic & home

<table>
<thead>
<tr>
<th>Variable</th>
<th>$M$</th>
<th>$SD$</th>
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<tbody>
<tr>
<td>Age</td>
<td>5.48</td>
<td>0.85</td>
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<tr>
<td>DAS-II</td>
<td>102.8</td>
<td>16.7</td>
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<tr>
<td>CELF-4 Core Language</td>
<td>103.5</td>
<td>13.7</td>
</tr>
</tbody>
</table>
Change in Behavior: Social Responsiveness Scale (SRS)

Yang et al. (2016) *Translational Psychiatry*
Neuro-prediction of treatment response

Yang et al. (2016)  
*Nature: Translational Psychiatry*
4) Levers to improve treatment response?
Intranasal Oxytocin – Social Judgments

Gordon et al. (2013) Proceedings of the National Academy of Sciences
5) But is it practical?

So maybe?
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