

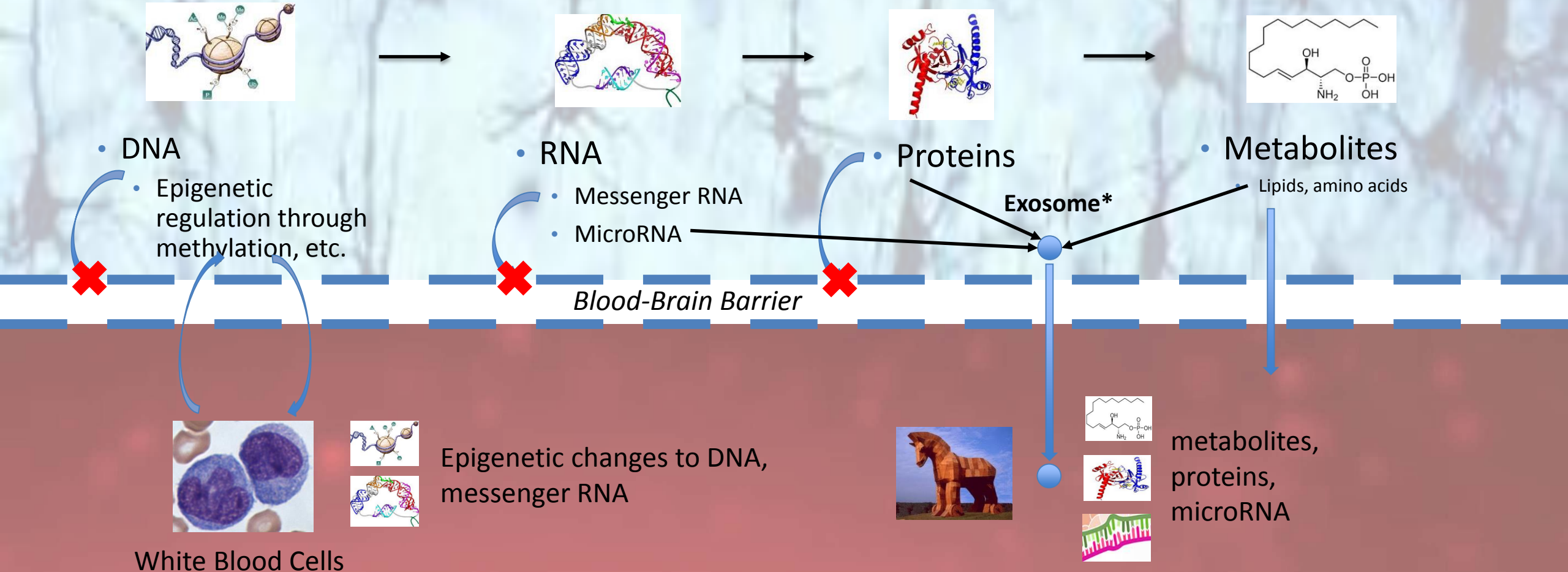
Blood Biomarkers of Stroke Recovery

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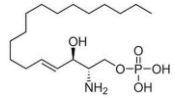
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Assessing Neural Systems Biology from Plasma



*Shah, Patel, and Freedman, NEJM 2018

Blood Biomarkers of Neurologic Disease



Metabolomics



Exosomal microRNA

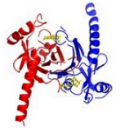
Preclinical Alzheimer's Disease

- Followed 525 adults > 70 for 5 yrs
- 28 converted to dementia/MCI
- Compared converter to healthy non-converters
- 10 metabolite panel had 90% accuracy discriminating groups
- Not related to ApoE4 status

Multiple Sclerosis

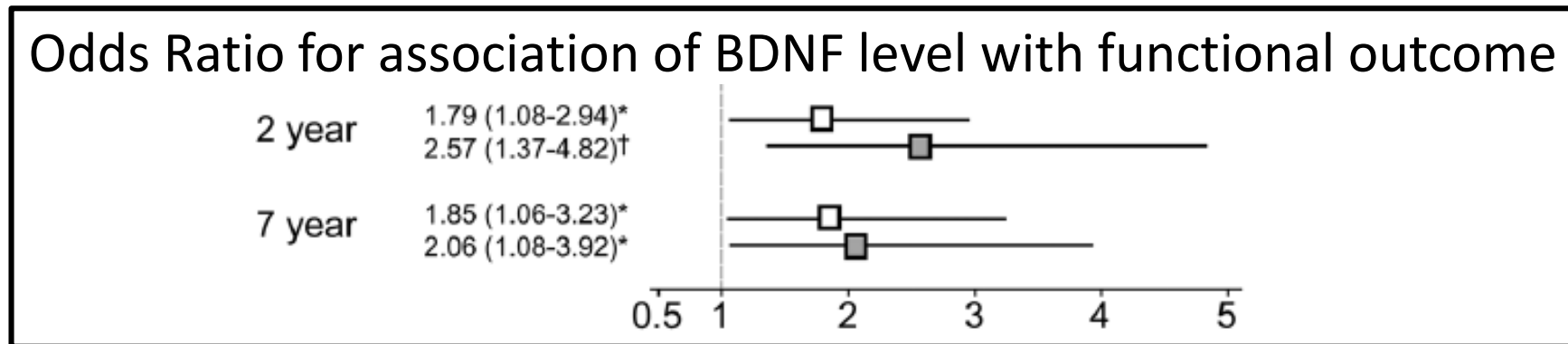
- 101 relapsing-remitting MS patients, 51 matched controls
- Split into discovery and validation cohorts
- 4 microRNAs discriminated:
 - MS vs. control
 - Relapse vs. stable disease
 - Gadolinium enhancement on MRI vs. no enhancement

Prior Blood Biomarker Studies in Stroke Recovery



Proteomics

- Low serum BDNF levels associated with worse recovery
 - >500 stroke patients
 - Pts with lowest tertile BDNF vs. top 2 tertiles
 - mRS 0-2 = poor recovery



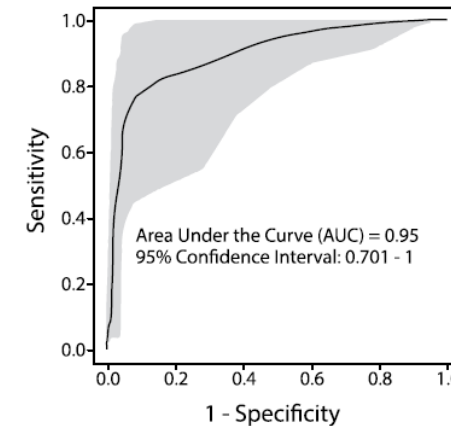
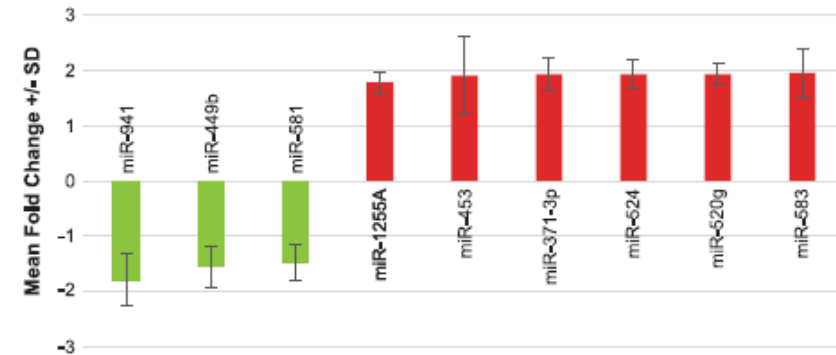
- Very few blood biomarker of stroke recovery studies in humans!

Plasma microRNA markers of upper limb recovery



- Samples from 27 CPASS participants
- Collected 19 days post-stroke
- Recovery based on delta ARAT, baseline – 6 mo.
- Good recovery > 6 pt change on delta ARAT

9 MicroRNAs with Differential Expression - Good vs. Poor Recovery



So Where's the Controversy???



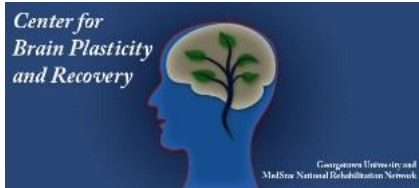
Optimized



PT/OT

	5 days	15 days	30 days	90 days	1 yr
BIOREC (observational)				Upper Ext Fugl-Meyer	
CPASS (clinical trial)			20 hrs OT		ARAT

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