



# Our True North: Family & Patient Impact on Research & Development

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August 16, 2019

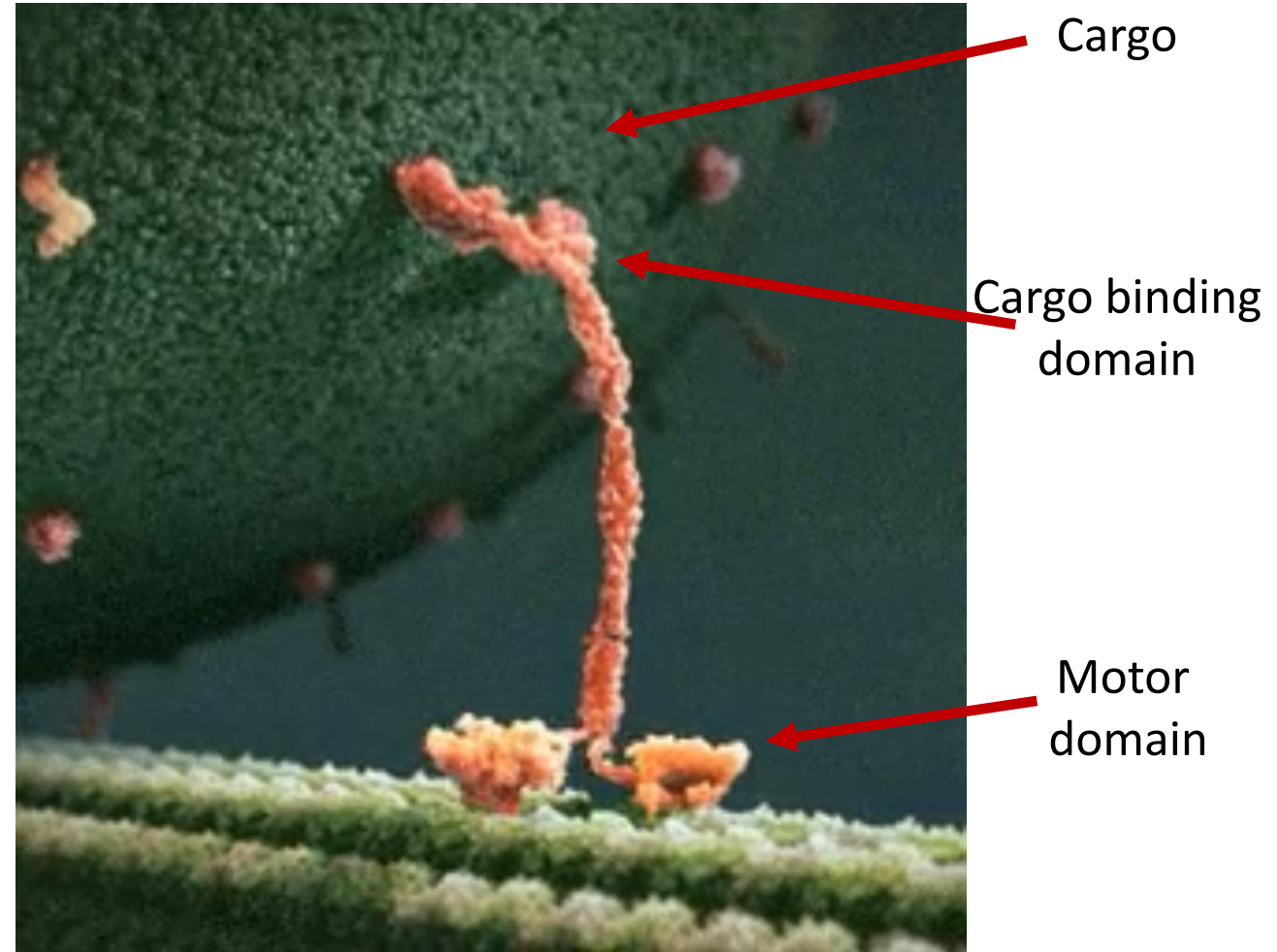
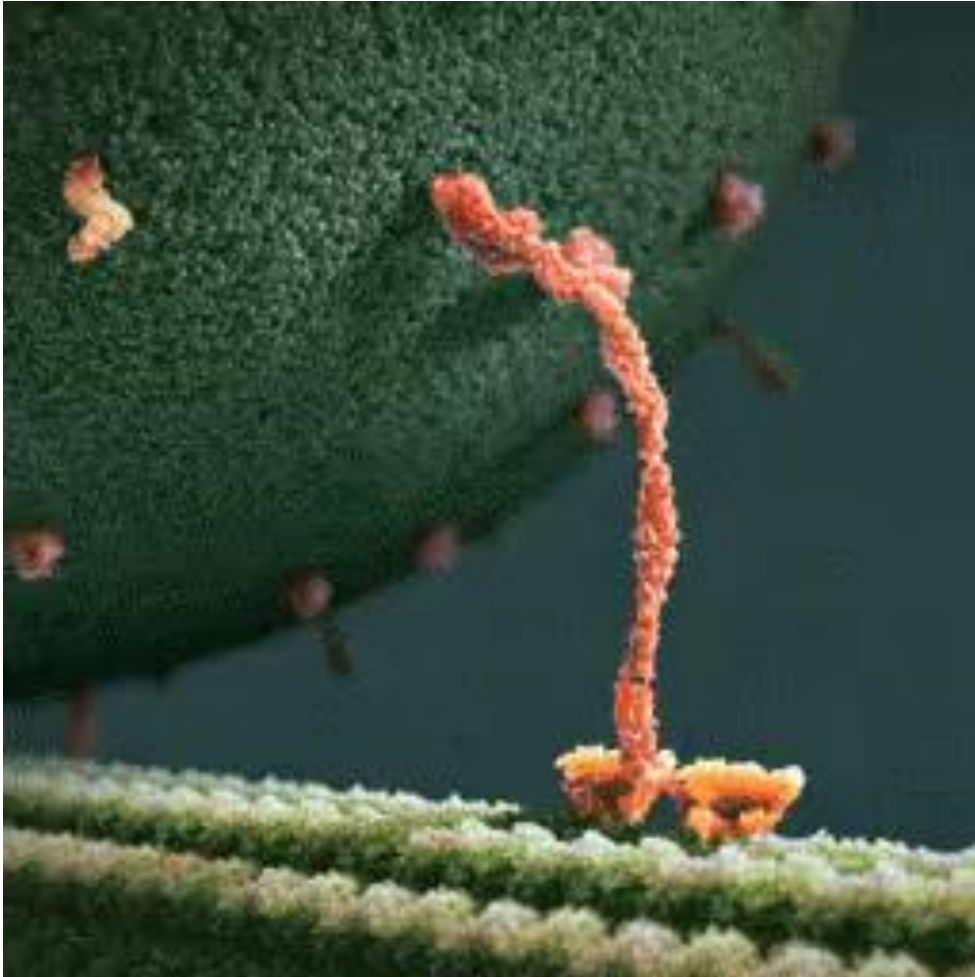
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# Research Strategy

August 16, 2019

Wendy Chung, MD, PhD

# *KIF1A* motors



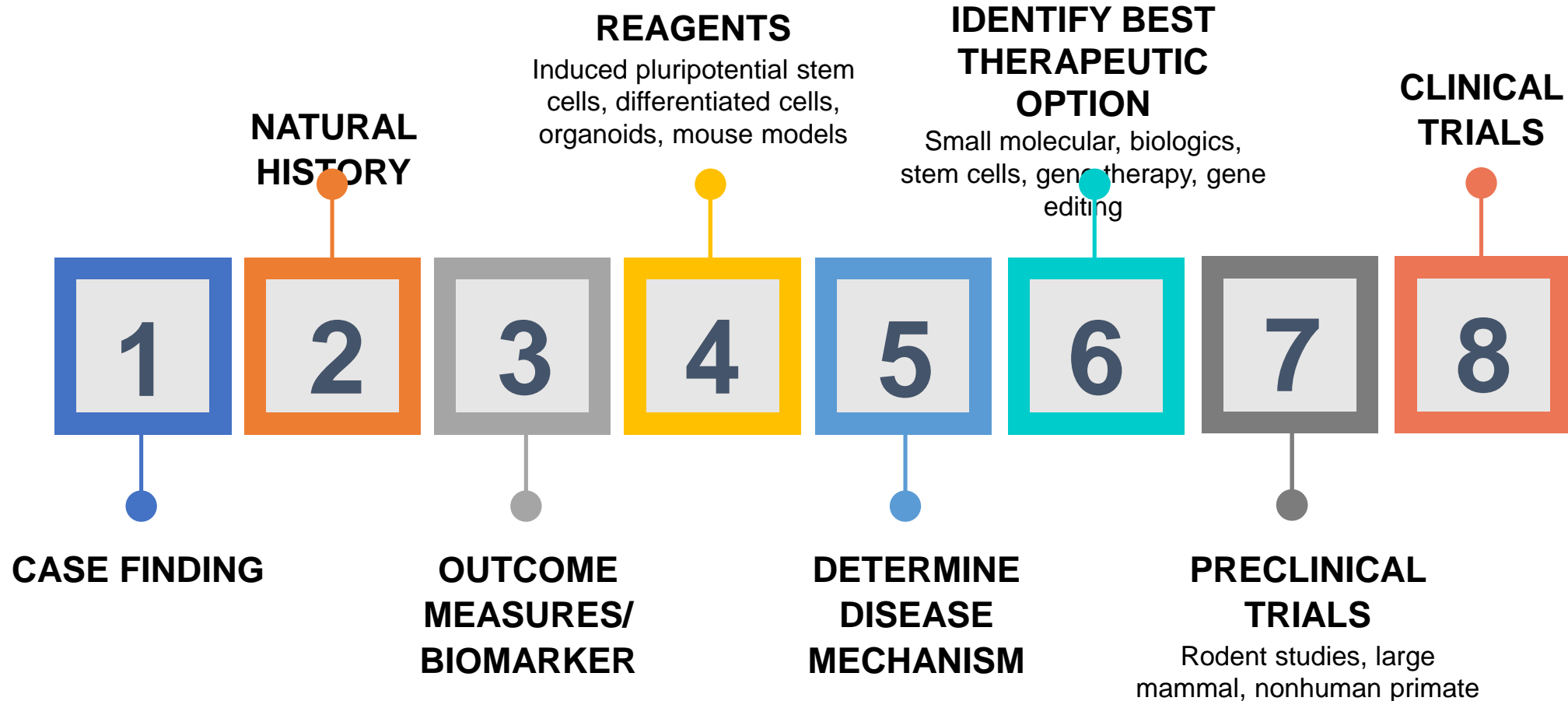
# The *KIF1A* problem

- Trains can run slower than they should (reduced cargo transport)
- Trains can get stalled at the station (no cargo transport)
- Trains can break down on the tracks and cause a traffic jam, preventing other trains from passing (no cargo transport, likely accumulation)



# TREATMENT

TARGETED RESEARCH AND EXPLORATION ADVANCING TRIAL MODELS,  
EDITING, AND NEXT-GENERATION THERAPIES



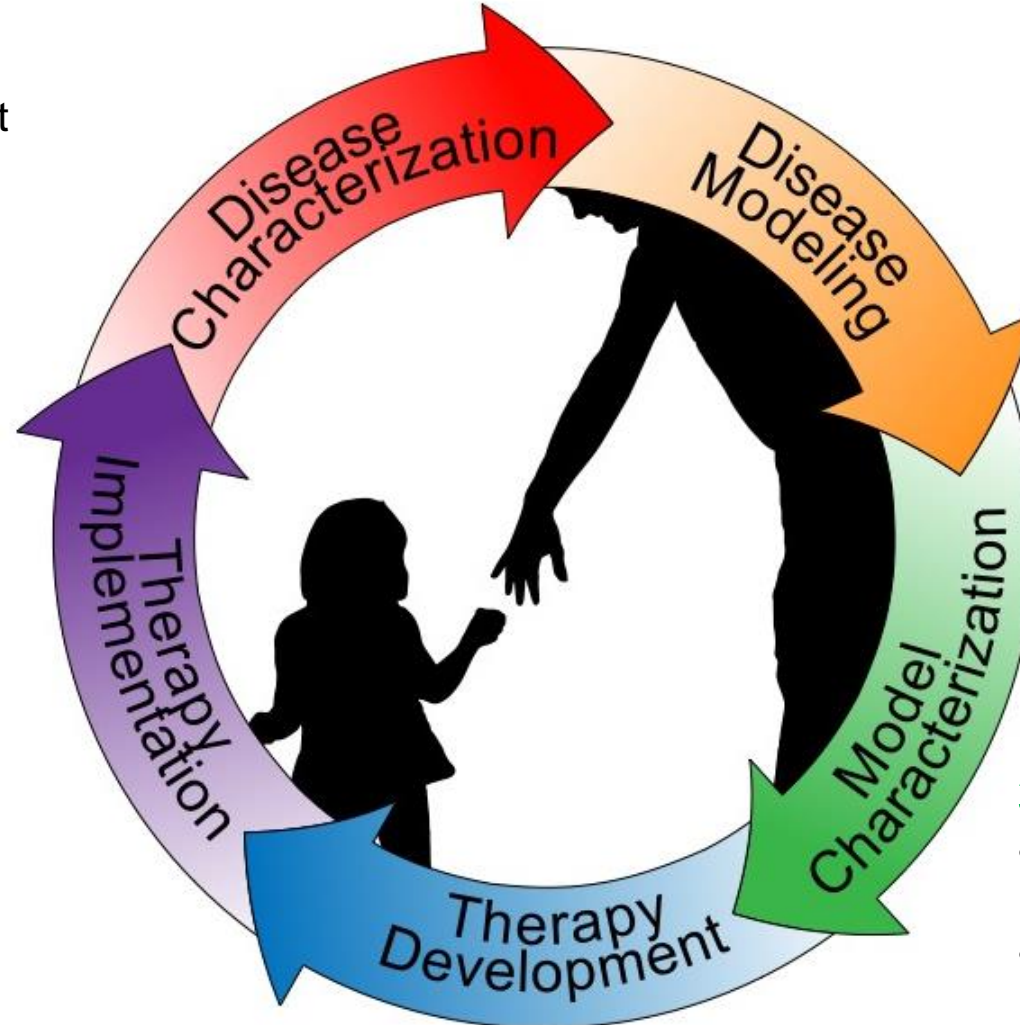
# KAND research overview

## 1. Disease Characterization

- Longitudinal natural history project
- Genotype/phenotype studies
- KAND patient biobank (including postmortem)
- Collect neuroimaging/raw EEG
- Additional seizure & medication questionnaire
- Meaningful difference to families
- Biomarkers

## 4. Therapy Development

- Small molecules
- Oligonucleotides
- Vectors for delivery



## 2. Disease Modeling

- In silico & in vitro analyses of motor function
- Patient-derived iPSC lines
- Differentiate PSCs into neurons
- Determine disease mechanism, genotype/phenotype correlation
- Generate patient-specific KI mouse models (*Jackson Labs*)

## 3. Model Characterization

- Behavioral & histological phenotype of mice
- Cellular morphology, electrophysiology
- Identify cellular assay amenable to high throughput screening

# *KIF1A* Genetic Tags

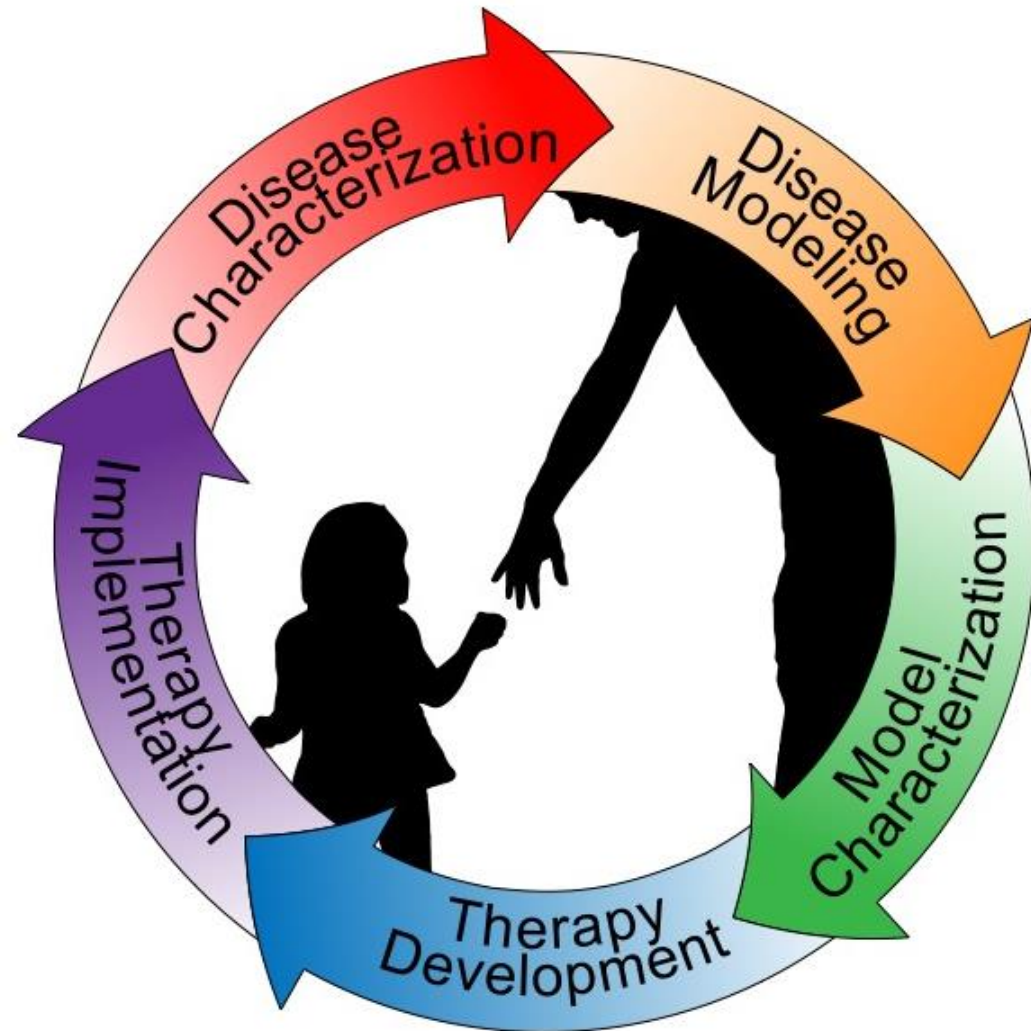


# What families can do

- Natural history study
  - Information from the past, present, and future
  - Genetic lab result
  - Caregiver report
  - Define meaningful difference
  - Medical records/therapists' evaluations/educators' evaluations
  - Assessments at the family meeting (height, weight, head circumference)
  - MRIs and EEGs
  - Priority is to determine what is working and what is harmful
- Samples, preferably blood
  - To determine if mutation is de novo or inherited
  - To know what other variants there are in KIF1A
  - To determine if there are other genes beyond KIF1A
  - To determine common genetic variants in KIF1A to target for oligonucleotides
  - Biomarker development
  - To provide a cell based model to ensure your family is represented
- Increase awareness: Rare Disease Day
- Partners/funders (call your senator/representative about NIH grant R01 NS114636-01)



# Questions?



Looking forward



**KAND Family & Scientific  
Engagement Conference**

August 16-17, 2019 | New York, NY

Thank you





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