#### CHARGE Syndrome Research: The Past and The Future



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Investigator	Institution	2012	2013	2014	2015	2016	2017	2019
Liz Hurd and Adam Stein	University of Michigan	2012 ¥	2013	2014	2013	2010	2017	2010
Bob Heyner	University of Washington	, r						
Kelvin Kwan	Rutgers	x						
Ching-Pin Chang	Stanford, now at Indiana University	x						
Michael Talkowski	Harvard		x					
Mats Liungman	University of Michigan		x					
Peter Scacheri	Case Western Reserve University		x					
Ruchi Bajpai	University of Southern California			x				
Fumiaki Imamura	Penn State University			x				
Allison Bardin	Institut Curie			x				
Conny van Ravenswaaij-Arts	Univ Gronigen			x				
Phil Gage	University of Michigan				x			
Faith Liebl	Southern Illinois University				x			
Kessen Patten	Universite de Montreal				х			
Kai Jiao	University of Alabama Birmingham				х			
Q. Richard Lu	University of Cincinnati					X		
Nicholas Pilon	University of Quebec at Montreal					x		
Albert Basson	King's College London					X		
Dan Marenda	Drexel University						х	
Anna Cariboni	Univ Milan, Italy						x	
Judith Yanowitz	University of Pittsburgh						x	
Weijun Feng and Haikun Liu	University of Heidelberg						х	
Ann Morris	University of Kentucky							x
Kurt Marsden	North Carolina State University							X
Stephanie Bielas	University of Michigan							х

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Mats Ljungman	University of Michigan		х					
Peter Scacheri	Case Western Reserve University		x					
Ruchi Bajpai	University of Southern California			х				
Fumiaki Imamura	Penn State University			х				
Allison Bardin	Institut Curie			X				
Conny van Ravenswaaij-Arts	Univ Gronigen			X				
Phil Gage	University of Michigan				x			
Faith Liebl	Southern Illinois University				x			
Kessen Patten	Universite de Montreal				х			
Kai Jiao	University of Alabama Birmingham				x			
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### How does research help people?

- Examples from sense organs that can be addressed experimentally:
- CHARGE involves deficient senses:
  –Hearing, balance, smell, taste, vision

Mouse model avails research avenues

# Cochlear implants can be improved using CHARGE mice















## Conclusions

- Animal models are available to develop therapy for the senses and other organs and systems affected in CHARGE
- Hearing can be enhanced by novel therapeutic technologies