Genetics spurs next generation of brain research

Baylor College of Medicine
HOUSTON -- (October 21, 2010) -- The field of neurogenetics soared during the decade since scientists first released a draft sequence of the human genome, said leaders in the field from Baylor College of Medicine [1] and Emory University School of Medicine in Atlanta in an overview published in the current issue of the journal Neuron.
The field, however, was ready to take off, building on the efforts that took place in the 1990s, resulting in the finding of critical genes such as that for Duchenne muscular dystrophy, Charcot-Marie Tooth and fragile X, said Dr. Huda Y. Zoghbi [2], professor of molecular and human genetics, pediatrics, neuroscience and neurology at BCM and Dr. Stephen T. Warren [3], professor of human genetics, pediatrics and biochemistry at Emory. Zoghbi is also director of the Jan and Dan Duncan Neurological Research Institute at Texas Children's Hospital [4] and a Howard Hughes Medical Institute investigator.

Certainly, the researchers noted, "cloning the gene for Rett syndrome (performed in Zoghbi's laboratory) would not have been possible in 1999 had it not been for the intense mapping and sequencing efforts of the X chromosome" that preceded it.

In their essay, Zoghbi and Warren note that national investment in such research has already paid off, not only in diagnosis and understanding of such diseases but also in the outlook for families afflicted by the disorders.

"Today, a large number of childhood and adult neurological disorders can be diagnosed by a simple DNA test on peripheral blood," the authors wrote. It is also easier to provide families with information on their risk of having another child with the disorder.

"While arguably the pace of development of potential therapies has been relatively slow compared to the speed of disease gene discovery, we should not underestimate the great benefits to families of disease prevention through prenatal diagnosis, and the gains in fundamental neurobiology from pathogenesis studies of neurological disorders," the authors wrote.

While emphasis has been placed on the human genome, the advances in understanding and developing model systems have proceeded apace, preparing the way for studies of treatments based on new understanding of neurobiology. When such work is responsible for human testing, they note that it requires an appropriate infrastructure built on partnerships between academic research, government, private institutions, foundation and the pharmaceutical industry.

The future will be enhanced by following a few principles:

- Invest in studies that will aid better understanding of normal brain

development, as this will helps disorders afflicting children as well as the adult and aging brain.
- The role of epigenetics (factors that affect the ability of genes to carry out their functions without altering their DNA sequence) and how it governs disease development must be carefully studied with an eye to modulating its effects to subdue disease.
- Understanding the plasticity and resilience of the developing and adult brain will help map the future of treatment and care.

"The findings that several disorders, including some of the more devastating developmental and degenerative diseases are reversible in mouse models, provides hope that discovering ways to counteract or suppress diseases might halt or even reverse some of the most serious neurological and psychiatric disorders," they wrote.

For more information on basic science research at Baylor College of Medicine, please go to www.bcm.edu/fromthelab [5].

SOURCE [6]

Source URL (retrieved on *12/27/2014 - 4:10am*):
http://www.mdtmag.com/news/2010/11/genetics-spurs-next-generation-brain-research?qt-most_popular=0

Links:
[1] http://www.bcm.edu/
[2] http://www.bcm.edu/genetics/index.cfm?pmid=11053
[3] http://genetics.emory.edu/faculty/faculty.php?facultyid=30
[4] http://www.nri.texaschildrens.org/
[5] http://www.bcm.edu/fromthelab
[6] http://www.bcm.edu/news/item.cfm?newsID=2941&r=1