

**BEFORE YOU START** 

Have you ever come across with a mental illness? Think of your experience, if any, and then read the passage.

nderstanding the biology of mental illness would be a paradigm shift<sup>1</sup> in our thinking about mind. It would not only inform us about some of the most devastating diseases of human kind but it would also tell us about who we are and how we function. After the discovery of the gene that causes Huntington's disease<sup>2</sup> in 1983, I expected that within 10 years we would have found the major genes that contribute to schizophrenia, depression and autism. But since then little progress has been made.

In the past few years, anyhow, certain advances in genetics have given us reasons for optimism since now we can look at the whole human genome and not at genes in isolation.

One major advance has been the discovery that the genome takes the form of copy number variation (CNV).A well-known example of a CNV is the extra copy of chromosome 21 resulting in Down syndrome. A specific type of CNV – called de novo mutations – may be relevant to autism. De novo mutations occur only in the sperm or egg and can appear only

# A biology of mental disorder

in the next generation. This fits the pattern<sup>3</sup> of autism, a genetic disease that occasionally emerges in families where the parents don't have autism and the same is for one of the sibling<sup>4</sup>. A mother and father could pass this mutation to one of their children since this mutation appears only in the sperm or eggs. Moreover, copy number variations and rare de novo mutations may also be a risk factor for schizophrenia.

Scientists are also making progress in finding the biological markers for depression, anxiety and obsessive-compulsive neurosis.

The most convincing scientific progress in psychiatry in the past decade has had little to do with genomics. It is the rigorous, scientific verification that certain forms of psychotherapy are effective. One of the major insights in the modern biology of learning and memory is that education, experience and social interactions affect the brain. Insofar<sup>5</sup> as psychotherapy works and produces stable, learned changes in behavior, it can cause stable anatomical changes in the brain. We are now beginning to measure such changes with brain imaging.

Taken together, these advantages could open up new approaches to the treatment of depression, bipolar disorders, and schizophrenia, areas that have been at a pharmaceutical standstill<sup>6</sup> for decades.

Adapted from *Newsweek's A Biology of Mental Order* (July 2009) by Eric Kandel, professor of biochemistry and biophysics at Columbia University and Nobel Prize in 2000 for his work on the molecular basis of memory.

#### Notes

- 1. **Paradigm shift**: a change in the way of thinking about the paradigm;
- 2. Huntington's disease: a neurological disease genetically transmitted;
- 3. **pattern**: the regular way in which something is done;
- 4. sibling: a brother or sister (formal);
- 5. insofar: therefore;
- 6. **standstill**: a situation in which there is no movement.

# > EXERCISES

#### A Match each of the following headings with a paragraph in the article. 1. New approaches to the treatment of some mental diseases [....] 2. Psychotherapy can significantly affect the human brain 3. The evolution of genetics **4.** The importance of the biology of mental illness [....] 5. The relation between CNV and autism 6. The progress in finding biological markers B Decide if these statements are true or false. Correct the false ones. **1.** The biology of mental illness is fundamental in thinking about human mind. (T)(F)2. In the past ten years there have been some advances in this branch of biology. (T)(F)3. A genome is much more variable than it was expected. (T)(F)

- 4. The variation called CNV is rather rare in (T)(F)everyone's genome.
- 5. Autism is a genetic disease that can be passed from the parents to their children. (T)(F)
- **6.** Progress has been made in finding biological TF markers for some genetic diseases.
- 7. Education. experience and social interactions don't influence the human brain. TF
- **8.** Psychotherapy can cause stable anatomical (T)(F)changes in the brain.

### Fill in each of the blanks in the passage with only one word:

De novo CNVs may explain (1) rise of
the true incidence <mark>(2)</mark> autism
(3) recent years. Autism cases have
also risen <mark>(4)</mark> part because
(5)better diagnostic criteria.
(6)class of mutation is more likely
(7)occur in people (8) have children late in their 30s and 40s -
(9)segment of population
(10) has been growing in recent years

# D Complete the following Compound Nouns in the first or second part of the phrases and open them.

- **1.** ..... change
- **2.** De novo
- 3. cells

[....]

[....]

- **4.** Risk
- 5. .... imaging
- **6.** ..... cases

# **Oral Practice**

**E** Work in pairs. In the passage some mental illnesses are mentioned (autism, depression, schizophrenia). Ask your classmate about what he/she knows about them. Collect your classmate's and your ideas about this subject and prepare a short presentation to the class.

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