Blood Glucose Monitoring Using a Biosensor Based on Porous Silicon (pSi).

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Existing methods of blood glucose monitoring have a large number of serious drawbacks that do not allow to use them effectively. We consider their major drawbacks are: - Price: an ordinary person with diabetes spends significant amounts of money on test strips monthly - Environmental safety: test strips are classified as class B in Russian waste classification. They are not recycled but incinerated By 2020, there were about 371 million people with diabetes, so our invention can significantly enhance the quality of their life. Having considered all the problems mentioned above, we decided not only to improve existing technologies but to develop new methods and materials that have not been used so far. To make monitoring more environmentally-friendly, we decided to find material that would be non-toxic, affordable and easily recycled. Having conducted all kinds of surveys and necessary experiments, we focused our attention on porous silicon. It has been widely used in environmental pollution control sensors but never in biosensors. The advantages of porous silicon are obvious: its preparation is rather simple and inexpensive. Besides, it allows to measure glucose level without using blood. Having conducted a series of experiments on tears and blood of a healthy person and a person with diabetes, we came to a conclusion that porous silicon is a suitable material for a biosensor, free from drawbacks of the majority of modern devices. The sensor has demonstrated its practical effectiveness in laboratory tests.