Universidade Federal do Pampa
Campus Bagé

Pró-reitoria de Pesquisa, Pós-Graduação e Inovação

e

Curso de Licenciatura em Letras: Línguas Adicionais - Inglês, Espanhol e Respectivas Literaturas

Teste de Proficiência em Inglês

08 de novembro de 2019

CPF:

O objetivo deste teste é comprovar sua proficiência em leitura e compreensão de textos em língua inglesa. Para tanto:

1) Leia atentamente o texto e as questões referentes aos textos;
2) Baseie-se somente no texto para responder as perguntas;
3) Utilize somente dicionário **impresso**.

Antes de começar o exame, certifique-se de que:

1) Desligará seus equipamentos eletrônicos;
2) Escreverá com caneta azul ou preta;
3) Utilizará somente as folhas de rascunho fornecidas;
4) Ao final do teste, entregará ao examinador o teste impresso e as folhas de rascunho.

Leia o texto de referência e depois responda aos questionamentos que os seguem. São 10 (dez) perguntas relativas ao texto. Cada questão poderá ser pontuada em até 1 ponto. São 10 pontos ao total.

A duração da prova é de 03 (três) horas.

Biological engineer Paul Blainey creates new tools to advance biomedical research: His technology platforms have benefited genomics, diagnostics, and drug screening.

By Anne Trafton

Microfluidics — the science of manipulating tiny amounts of fluid through channels — has been widely used in fields such as genomics, where it has helped to enable high-speed sequencing. Several years ago, Paul Blainey started to wonder why microfluidics was not used for drug screening, another application that requires analyzing huge amounts of samples quickly. **That** question led him and his students to develop a new type of microfluidics platform in which droplets are sealed within tiny wells, overcoming the problem of drug leakage that had stymied previous efforts. **This system** worked well for screening drugs, but it also ended up being useful for many other applications, far beyond what Blainey had originally envisioned.

"That's one of the things I love about science — you can have a thought about why doesn't microfluidics do more for chemistry, and then you develop something that turns out to have all these really exciting uses and applications that no one imagined," says Blainey, a member of the Broad Institute of MIT and Harvard and a newly tenured associate professor in the Department of Biological Engineering.

Blainey's lab takes a wide-ranging approach to solving technological problems, resulting in the development of many cutting-edge tools over the past several years, with applications in fields from genomics to diagnostics and drug development. He credits his students with helping to come up with ideas for novel technologies, and pursuing alternative directions until they find something that works. "The major research directions and technology platforms that the lab is known for today came out of this process where the students or I had a crazy idea, and then the lab executed on it, with all the twists and turns along the way," he says.

Filling the gaps

One area where Blainey saw a need for new technology was in screening potential drug compounds. One of the big **challenges** in screening drugs is making sure there is enough of each compound to test it against a huge number of single cells. Researchers weren't using microfluidics to help with these screens because drug molecules tend to leak out of the tiny droplets used in microfluidic devices.

One of Blainey's graduate students, Tony Kulesa, came up with an idea for a new way to solve the problem, which was to seal nanoliter droplets into an array of tiny wells on a microfluidic chip. This prevented the drugs from leaking out, and enabled large-scale screens. This technology turned out to be very useful for screening individual drugs and also combinations of drugs. In a **paper** published in 2018, the researchers showed that this system could be used to identify compounds that help existing antibiotics to work better. The Broad Institute is now launching a new center funded by the National Institute of Allergy and Infectious Diseases, where this platform will be used to search for additional compounds with antimicrobial activity.

It later turned out that this system could be useful for a variety of experiments that involve testing the interactions of many different combinations

of cells or molecules. The droplet array platform allows the test to be carried out on many samples at a time, and to simultaneously test for many different diseases. Another technique Blainey recently developed, known as optical pooled screening, allows researchers to examine how genes affect complex cellular processes, with spatial and temporal resolution. This technique, described in *Cell* on Oct. 17, combines large-scale pooled genetic screens with image-based analysis of cell behavior.

Blainey's lab continues to seek out new areas that could benefit from technological innovation, while also pursuing potential applications for the tools they have already developed. "Our antennae are sensitive to these general types of technical barriers where if you can come up with robust and general solutions, it really unlocks a lot of stuff. But we're also excited to dig further into the biology using tools we've already developed," he says. "It's a bit like grassroots politicking — you really have to get out there and pound the pavement and show how it can be used in different ways."

Adapted from TRAFTON, Ann. **Biological engineer Paul Blainey creates new tools to advance biomedical research:** His technology platforms have benefited genomics, diagnostics, and drug screening. MIT News Office. 19 out. 2019. Disponível em: http://news.mit.edu/2019/paul-blainey-biological-engineer-1020. Acesso em: 22 de out. de 2019.

Questões de 1 a 10, responda as perguntas e escolha as alternativas mais adequadas:

1) Qual é a principal questão discutida pelo texto?

_____
_____
_____
_____

2) De acordo com o texto, quais são os objetivos do laboratório que Paul Blainey coordena?

a) Procurar novas áreas que necessitem inovações tecnológicas e potencializar o uso de equipamentos já desenvolvidos.
b) Dar crédito a sua equipe e potencializar o uso exclusivo da plataforma de microfluidos.
c) Procurar desenvolver novas ideias e dar crédito somente a plataforma de microfluidos.

3) Em relação aos achados desta pesquisa, qual a mais importante contribuição do pesquisador Tony Kulesa?

a) Ele pensou em selar gotas de antibióticos para fazer análises em medicamentos manipulados.
b) Ele pensou em selar gotas de nanolitros dentro de um conjunto de pequenos poços numa microplaqueta.
c) Ele pensou em analisar substâncias manipuladas que fazem com que antibióticos funcionem melhor.

4) O que é inovador nos resultados da pesquisa realizada no laboratório que Paul Blainey coordena?

a) A plataforma de microfluidos pode ser utilizada em outros experimentos já que permite analisar poucas amostras ao mesmo tempo e simultaneamente testar algumas doenças.
b) A plataforma de microfluidos pode beneficiar outros experimentos já que permite analisar várias amostras uma de cada vez e simultaneamente testar os medicamentos para muitas doenças diversas.
c) A plataforma de microfluidos permite que outros experimentos sejam criados mesmo que a análise seja feita em poucas amostras.

5) Qual barreira os pesquisadores conseguiram superar com a aplicação da ciência de microfluidos para análises de medicamentos?

a)O problema do vazamento de antibióticos que impossibilitava que pesquisas anteriores fossem bem sucedidas.
b) O problema de superlotação de substâncias que impossibilitava que pesquisas anteriores fossem bem sucedidas.
c) O problema de vazamento de substâncias que impossibilitava que pesquisas anteriores fossem bem sucedidas.

6) O pronome **that** (linha 5) se refere, no texto, a qual questão:

a) Por que a ciência de microfluidos fazia parte da análise de medicamentos?
a) Por que analisar grandes quantidades de amostras rapidamente?
b) Por que a ciência de microfluidos não era utilizada para análise de medicamentos?

7) A expressão **this system** (linha 8), no texto, pode ser substituida, sem perda de sentido, por:

a) A new type of microfluidic platform
b) A new type of drug screening
c) A new type of drug compounds

8) A expressão **challenges** (linha 28) pode ser traduzida, sem perda de sentido, por:

a) Fugas
b) Desafios
c) Acúmulos

9) A palavra **paper** (linha 37) não pode ser traduzida, devido ao seu sentido no texto, por:

a) Ensaio
b) Papel
c) Artigo

10) Traduza o excerto abaixo (linhas 41 a 44) , de modo que ele não perca o sentido pretendido pelo autor do texto:

"Blainey's lab takes a wide-ranging approach to solving technological problems, resulting in the development of many cutting-edge tools over the past several years, with applications in fields from genomics to diagnostics and drug development".