

応用和漢医薬学プログラム (Applied Natural Medicine)

受験番号 (Examinee's No.)

科目名 (Subject) 外国語 (英語) (Foreign Language (English)) 氏名 (Name)

(全2枚中の1枚目)

(裏面にわたる場合は、この線より下に解答すること。)

(If your answer is longer than the space provided, you can write on the back of this page, but please write below this line.)

Aspirin, often referred to as the "king of medicines," stands as a quintessential example of pharmaceuticals derived from medicinal plants. In the context of this program, understanding the knowledge of plant-based medications is crucial. Therefore, describe in as much detail as possible what you know about aspirin including recent new application examples.

【出題の意図 (Intention of the question)】

薬用植物由来の医薬品は現在もお極めて重要な位置を占めている。これら先例薬用植物由来の医薬品の開発経緯や作用を知識として身につけることは、今後応用和漢医薬学プログラムで学ぶ上で大切な要素であると考えられる。

そこで、薬用植物由来の医薬品の代表例であるアスピリンについての論述を英語で求める。

アスピリンは、従来の解熱鎮痛作用のみならず、少量の使用では心筋梗塞、脳梗塞、突然死などの予防効果、さらには各種固形がんに対する予防効果も近年注目されていることから、英語試験の題材として取り上げた。

【解答例 (Sample Answer)】

Aspirin, also known as acetylsalicylic acid (ASA), is a nonsteroidal anti-inflammatory drug (NSAID). It is commonly used to reduce pain, fever, and inflammation.

Aspirin has several uses, including:

- Pain relief: Effective for headaches, muscle aches, and joint pain.
- Fever reduction: Helps lower body temperature.
- Anti-inflammatory: Reduces inflammation and swelling.
- Cardiovascular health: Used to prevent heart attacks, strokes, and blood clots in high-risk individuals.
- Treatment of certain conditions: Such as Kawasaki disease, pericarditis, and rheumatic fever.

Aspirin works by inhibiting the production of prostaglandins (inhibition of Cox), which are chemicals in the body that promote inflammation, pain, and fever. It also suppresses the normal functioning of platelets, which are involved in blood clotting.

Common side effects of aspirin include:

- Upset stomach
- Stomach ulcers and bleeding
- Worsening asthma
- Ringing in the ears (tinnitus) with high doses

Precautions

- Not recommended for children: Due to the risk of Reye's syndrome, a serious condition affecting the liver and brain.
- Pregnancy: Should be avoided in the last part of pregnancy.
- Allergies: Avoid if allergic to NSAIDs.
- Bleeding disorders: Not suitable for individuals with bleeding disorders or recent stomach/intestinal bleeding.

History

- Aspirin is derived from salicylic acid, which has been used for its health benefits for over 2,400 years. The modern form of aspirin was first synthesized in 1853 by chemist Charles Frédéric Gerhardt.

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Aspirin and Cancer Prevention

Research over the past few decades has suggested that regular use of aspirin may have a preventive effect on certain types of cancer. Here are some key points:

Colorectal Cancer

- **Strong Evidence:** The most consistent evidence for aspirin's cancer-preventive effects is in colorectal cancer. Studies have shown that regular aspirin use can significantly reduce the risk of developing colorectal cancer.
- **Mechanism:** Aspirin reduces inflammation and abnormal blood vessel growth, which are key factors in the development of colorectal cancer.

Other Cancers

- **Breast Cancer:** Some studies suggest a reduced risk of breast cancer with regular aspirin use, but the evidence is not as strong as for colorectal cancer.
- **Prostate Cancer:** There is mixed evidence regarding aspirin's effect on prostate cancer, with some studies showing a reduced risk and others showing no significant effect.
- **Other Cancers:** Research is ongoing to determine if aspirin can help prevent other types of cancer, such as lung, esophageal, and stomach cancers.

Clinical Trials and Recommendations

- **ASPREE Trial:** A large clinical trial called ASPREE found that for adults aged 70 or older, taking low-dose aspirin daily may increase the risk of advanced cancer. However, it did not significantly reduce the overall incidence of cancer.
- **USPSTF Recommendations:** The U.S. Preventive Services Task Force (USPSTF) recommends low-dose aspirin for certain individuals to reduce the risk of cardiovascular disease and colorectal cancer.

Mechanisms of Action

- **Inflammation Reduction:** Aspirin inhibits the production of prostaglandins, which are chemicals that promote inflammation.
- **Platelet Function:** Aspirin suppresses platelet aggregation, which can reduce the risk of cancer by preventing abnormal blood clotting and tumor growth.
- **Immunologic Effects:** Aspirin may enhance the body's immune response to cancer cells.

Considerations and Precautions

- **Side Effects:** Regular aspirin use can lead to side effects such as gastrointestinal bleeding and ulcers.
- **Individual Risk:** The decision to use aspirin for cancer prevention should be made in consultation with a healthcare provider, considering individual risk factors and medical history.

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科目名 (Subject)

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小論文・適性検査 (Short Essay and Aptitude Test)

分野名 (Educational Area) Bio-functional Molecule Engineering 氏名 (Name)

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応用和漢医薬学プログラムでは、様々なアプローチによって和漢医薬学の応用に貢献できる人材を育成することになる。あなたの研究内容をいかに和漢医薬学の応用に資することができるか、また研究を進めるにあたり、あなたの研究の意義を述べた上で、解決すべき課題と解決に向けた方略を述べなさい。英語、日本語どちらで回答しても構いません。

In the program of Applied Natural Medicine, we will cultivate human resources who can contribute to the application of natural medicine through various approaches. How can your research contribute to the application of natural medicine? And as you proceed with your research, state the significance of your study, identify the issues that need to be addressed, and describe the strategies for addressing them.

You may answer in either English or Japanese.

【出題の意図 (Intention of the question)】

大学院教育において最も重要なことは、如何に自ら進んで学ぶことができる環境を整えるか、即ち「アクティブラーニング」の機会を提供できるかである、そのためには、自身の研究内容、研究の意義、解決すべき課題の把握、および解決方法を熟知する必要がある。当該プログラムのディプロマポリシーに照らした人材育成を推進するためには、入学時に上記考えをしっかりと備えていること、および入学後は本プログラムで用意されているカリキュラムを能動的に学ぶ必要がある。これらを踏まえて、上記内容の小論文、適性検査を実施する必要があることを出題の意図としている。