Link to News Coverage:

<http://www.bbc.co.uk/news/uk-northern-ireland-12405094>

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# BBC

# QUB scientists' 'breakthrough' on cancer enzyme role

Scientists at Queen's University, Belfast, are behind a medical breakthrough which could boost survival rates for people with cancer.

Their findings could help reduce heart failure in cancer patients - offering them a greater chance of living longer.

Researchers at the Queen's Centre for Vision and Vascular Science have identified the role of the enzyme NADPH oxidase in heart failure.

This means work can now go ahead to make chemotherapy more effective.

When a patient receives chemotherapy, this enzyme can cause life-threatening damage to the heart.

Until now, doctors have had to restrict the number of chemotherapy sessions for patients to protect the heart.

The downside of this is that the chemotherapy is less effective.

Professor Barbara McDermott and Dr David Grieve are joint leaders of the research at Queen's School of Medicine, Dentistry and Biomedical Sciences.

Dr Grieve said: "While chemotherapy drugs are highly effective in treating a wide range of tumours, they can also cause irreversible damage to the heart.

"This means that doctors are restricted in the doses they can administer to patients. In recent years, scientists have been searching for new drugs to prevent these side-effects.

"Although we have known about the NADPH oxidase enzyme for many years, until now, we were not aware of its crucial role in causing heart damage associated with chemotherapy.

"Our research findings hold clear potential for the creation of new drugs to block the action of the enzyme, which could significantly reduce heart damage in cancer patients.

"Ultimately, this could allow for the safer use of higher doses of chemotherapy drugs and make the treatment more effective against tumours."

Around 7% of cancer patients treated with the upper limit dosage of chemotherapy agent Doxorubicin currently develop heart failure.

The scientists examined the adverse effects of doxorubicin, which is a commonly-prescribed chemotherapy agent used to treat a wide range of cancers.

Other more specific chemotherapy drugs, such as herceptin (which is used to treat breast cancer), are also known to have damaging effects on the heart, although these could occur via different mechanisms.

Dr Grieve said: "As doxorubicin is the most widely used chemotherapy agent we chose to focus our research on this, but it is likely that the toxic effects of other chemotherapy drugs on the heart may also involve NADPH oxidase so could be therapeutically targeted in a similar manner."

Despite improved treatments, cancer remains the cause of 25% of all deaths in the western world.

Scientists at Queen's are now concentrating on defining the precise role of NADPH oxidase in the development of heart failure associated with cancer therapies.

They hope this could lead to the development of a drug with the potential to save lives.

The research was funded by the British Heart Foundation in Northern Ireland and published in leading international journal, Cancer Research.

Press Association

PA Newswire: Northern Ireland

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ENZYME STUDY MAY HELP CANCER BATTLE  
  
BYLINE: Steven McCaffery, Press Association  
  
SECTION: PA Newswire: Ireland  
  
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The battle against cancer could be boosted after a breakthrough by scientists at Queen's University Belfast.

The university said new research could help prevent the heart damage potentially caused by chemotherapy treatments.

It is hoped the findings will help devise medicines to counteract the side-effects and reduce heart failure in cancer patients.

Scientists at Queen's Centre for Vision and Vascular Science have discovered the role of an enzyme which, when a patient receives chemotherapy, can cause life-threatening damage to the heart.

The researchers said it has restricted the amount of chemotherapy doses a patient can receive.

David Grieve, jointly leading the research at Queen's School of Medicine, Dentistry and Biomedical Sciences, said: ``While chemotherapy drugs are highly effective in treating a wide range of tumours, they can also cause irreversible damage to the heart.

``This means that doctors are restricted in the doses they can administer to patients. In recent years, scientists have been searching for new drugs to prevent these side-effects.

``Although we have known about the NADPH oxidase enzyme for many years, until now, we were not aware of its crucial role in causing heart damage associated with chemotherapy. Our research findings hold clear potential for the creation of new drugs to block the action of the enzyme, which could significantly reduce heart damage in cancer patients.

``Ultimately, this could allow for the safer use of higher doses of chemotherapy drugs and make the treatment more effective against tumours. Despite improved treatments, cancer is currently responsible for 25% of all mortality in the western world. By reducing the risk of heart failure associated with chemotherapy, patient survival rates could be significantly increased.''

Scientists at Queen's are concentrating on further studies to define the precise role of NADPH oxidase in the development of heart failure associated with cancer therapies.

It is hoped that these may lead to the development of a drug which would have the potential to save lives among cancer patients.

The research by Dr Grieve and Professor Barbara McDermott was funded by the British Heart Foundation in Northern Ireland and published in leading international journal Cancer Research.

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By [Martin Beckford](http://www.telegraph.co.uk/journalists/martin-beckford/), Health Correspondent

# TELEGRAPH

# Chemotherapy patients to benefit from enzyme discovery

## Cancer survival rates could increase following a discovery that will improve chemotherapy treatments.

Scientists have identified the role of an enzyme that can lead to heart failure among patients who are receiving drugs to kill tumours.

By creating new drugs to block this enzyme, called NADPH oxidase, researchers will be able to increase the doses of chemotherapy that cancer sufferers can receive and so make the treatment more effective.

Scientists at Queen's University Belfast hope that in the long run, their discovery will increase cancer survival rates.

Recent figures suggest that 156,000 people in Britain alone will succumb to the disease this year.

Dr David Grieve, jointly leading on the research at Queen's School of Medicine, Dentistry and Biomedical Sciences said: “While chemotherapy drugs are highly effective in treating a wide range of tumours, they can also cause irreversible damage to the heart.

This means that doctors are restricted in the doses they can administer to patients.

In recent years, scientists have been searching for new drugs to prevent these side-effects.

“Although we have known about the NADPH oxidase enzyme for many years, until now, we were not aware of its crucial role in causing heart damage associated with chemotherapy.

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