A deadly form of skin cancer is able to fend off the body's immune system, UK researchers have found.

Analysis of tumour and blood samples shows that melanoma knocks out the body's best immune defence.

A potential test could work out which patients are likely to respond to treatment, the Journal of Clinical Investigation reports.

Cancer Research UK said the body's response was a "complex puzzle".

Previous work from the team at King’s College London showed that while patients with melanoma produced antibodies that could attack tumour cells, the immune system often seemed powerless to stop the cancer progressing.

But in the latest research they discovered that the subtype of antibody attracted by the melanoma cells was the most ineffective at mounting the right sort of response.

In samples from 80 melanoma patients they say that the conditions created by the tumour attract IgG4 antibodies, which mount the weakest response and in turn interfere with any "strong" IgG1 antibodies that might be present.

“This work is still at an early stage, but it's a step towards developing more effective treatments for skin cancer”

Dr Kat Arney Cancer Research UK

By mimicking the conditions created by melanomas, they showed that in the presence of tumour cells, the immune system sent out IgG4 antibodies, but when faced with healthy cells it functioned as expected with IgG1 circulating.

They also confirmed that IgG4 was ineffective in launching an immune attack against cancer
cells.

Potential test
In additional tests in 33 patients, they found that those with higher levels of the weak antibody IgG4 had a less favourable prognosis compared with those with levels nearer to normal.

Study author Dr Sophie Karagiannis said: "This work bears important implications for future therapies since not only are IgG4 antibodies ineffective in activating immune cells to kill tumours but they also work by blocking antibodies from killing tumour cells."

She said not only was IgG4 stopping the patient's more powerful antibodies from eradicating cancer, but it could also explain why some treatments based on boosting the immune response may be less effective in some patients.

Co-author Prof Frank Nestle said more work was needed on developing IgG4 as a potential test to improve patient care by helping to identify patients most likely to respond to treatments.

"This study can also inform the rational design of novel strategies to counteract IgG4 actions," he added.

Dr Kat Arney, science communications manager at Cancer Research UK, said: "There's a lot we don't yet understand about how our immune system recognises and responds to cancer, so we're pleased to have supported this new research that's helping to solve such a complex puzzle."

"This work is still at an early stage, but it's a step towards developing more effective treatments for skin cancer and potentially other types of cancer in the future."