

# 'Intelligent medicine' erases side effects

May 31 2012

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Scientists at Aarhus University, Denmark in collaboration with the biotech company Cytoguide now publish a key to use glucocorticoid steroids in a kind of intelligent medicine that specifically hits the relevant cells. Data are based on rodent studies but if this principle is translated to humans it may greatly improve today's hazardous treatment with this type of potent steroids.

This is the main perspective in the research now published in the recognized research journal *Molecular Therapy* in the [Nature Publishing group](#).

Synthetic glucocorticoid steroid are used in many acute and [chronic inflammatory diseases](#) including many [autoimmune diseases](#) such as [rheumatoid arthritis](#). This is the most potent anti-inflammatory medicine, but its use is hampered by serious side effects such as osteoporosis, loss in muscle mass, diabetes and immunosuppression.

The new data from the scientists now show that they can target the drugs directly to the 'macrophage' [immune cells](#). These cells play a main role in inflammation and their damaging effect on the surrounding tissues is strongly dampened by the glucocorticoid steroids.

The new technology is based on the coupling of the steroids to an antibody that specifically binds to a receptor exclusively expressed on the surface of macrophages. The receptors normally take up haemoglobin but they are also able to engulf drug-conjugates binding to the receptors. In the cells, the active steroid is released and it can now

execute its effect (gene regulation).

In this way the drug only works in the relevant cells and much less is needed to obtain full efficacy.

'Our project may initially have relevance for inflammation disease and our focus is now on the [liver inflammation](#) that affects many persons with fatty liver due to obesity or alcohol abuses' Søren K. Moestrup from Aarhus University says.

'But this technology may also be applied on completely different types of diseases such as cancer' he continues.

If the scientists get financing and collaboration with the large pharma industry in place they expect to have the first conjugate medicine on the market in about 6 years.

**More information:** "Targeting the hemoglobin scavenger receptor CD163 in macrophages highly increases the anti-inflammatory potency of dexamethasone". *Molecular Therapy*.

Provided by Aarhus University

Citation: 'Intelligent medicine' erases side effects (2012, May 31) retrieved 6 May 2024 from <https://medicalxpress.com/news/2012-05-intelligent-medicine-erases-side-effects.html>

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