

Molecular mode of action of *Nigella sativa* in type 2 diabetes

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Aim of the research:

- Investigate the effects of *Nigella sativa* (black cumin) on the protein amylin (hIAPP) which is associated with type 2 diabetes mellitus.
- Investigating whether *Nigella sativa* and its active ingredient can be developed into a natural treatment for type 2 diabetes mellitus.

Method:

The inhibitory effects of *Nigella sativa* on amylin fibrillisation will be examined by using the thioflavin T fluorescence (ThT) assay, transmission electron microscopy (TEM), circular dichroism (CD) spectroscopy, mammalian cell cytotoxicity assays, and potentially molecular dynamics simulations.

Background and findings:

In 90% of type 2 diabetic patients, amylin (also known as hIAPP) has been found as fibrillar deposits in various parts of the body. These amylin aggregates are thought to damage B cell function thus affecting insulin regulation and causing diabetes.

Finding ways to prevent, slow or reverse the process of amylin fibril formation could be a good therapeutic target for treating diabetes. T2DM is usually treated by a mixture of fasting, diet control, and medication, however, these methods have many problems, thus, scientists have been exploring natural compounds as alternatives with more efficacy and safety to treat T2DM.

There are numerous remedial plant extracts with less side effect comparable to chemical medications. Many studies showed that the *Nigella sativa* was reported to possess various therapeutic effects due to thymoquinone, which is one of the major compounds along with thymol, thymohydroquinone, dithymoquinone, nigellone, alpha-hederin, flavonoids, and fatty acids.

Anticipated Impact:

Confirmation of the hypothesis of the *Nigella sativa* has an effect to T2DM, and it can help to improve glycaemic control by using a solution which is available, affordable, and scientifically validated for the population.