In a new study, scientists at the University of Pennsylvania (Penn) have discovered that a protein previously shown to treat gum disease also blocks relapses in mice with a condition similar to multiple sclerosis (MS).

The leap from experimenting on gum disease to investigating the effects of this protein, called Del-1, on MS came when researchers realized that it plays a key role in the body's immune response. Del-1 regulates how immune cells circulate and accumulate. When there are low levels of Del-1 as was the case for the mice with gum disease, the inflammation becomes chronic, resulting in damage to gum tissue and the underlying bone.

When the investigators injected Del-1 into the mice's gum tissue, they found that the infection cleared. This was an illuminating discovery, and the team began to consider the implications for other inflammatory diseases.

How Does Del-1 Affect MS?

The team examined brain tissue from both healthy people and people with MS. They found far lower...
levels of Del-1 in the brain tissue of those who had chronic disease activity at the time of their death compared to healthy tissue or tissue from MS patients who had been in remission when they died. The researchers also noted that mice that were given the MS-like disease experimental autoimmune encephalomyelitis (EAE) had lower levels of Del-1.

To test their theory about Del-1’s role in MS, they waited for the mice with EAE to have a relapse, when levels of the protein would be lowest. After injecting the mice with Del-1, the researchers noticed that the relapses stopped and the mice had no further flare-ups.

“This treatment prevented further disease relapse,” senior author Dr. Triantafyllos Chavakis of Germany’s Technical University Dresden said in a press release. “Thus, administration of soluble Del-1 may provide the platform for developing novel therapeutic approaches for demyelinating diseases, especially multiple sclerosis.”

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This study suggests that reduced production of Del-1 is part of the MS disease process. Finding a way to replace the needed protein — or trigger the body to produce it — could be a new target for MS drug research.

Hajishengallis said his team’s future research will focus on “whether the useful properties of Del-1 can be localized in specific parts of the protein. This may make the protein more ‘druggable.’ We [will] also investigate novel properties of Del-1 and want to see its role in additional tissues and diseases.”

In an immune response, there are many players. Certain cells secrete substances called cytokines that can stop production of Del-1. In a healthy immune system combating an acute infection, for example, that’s a good thing. It allows immune cells to be deployed quickly to fight the infection.

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