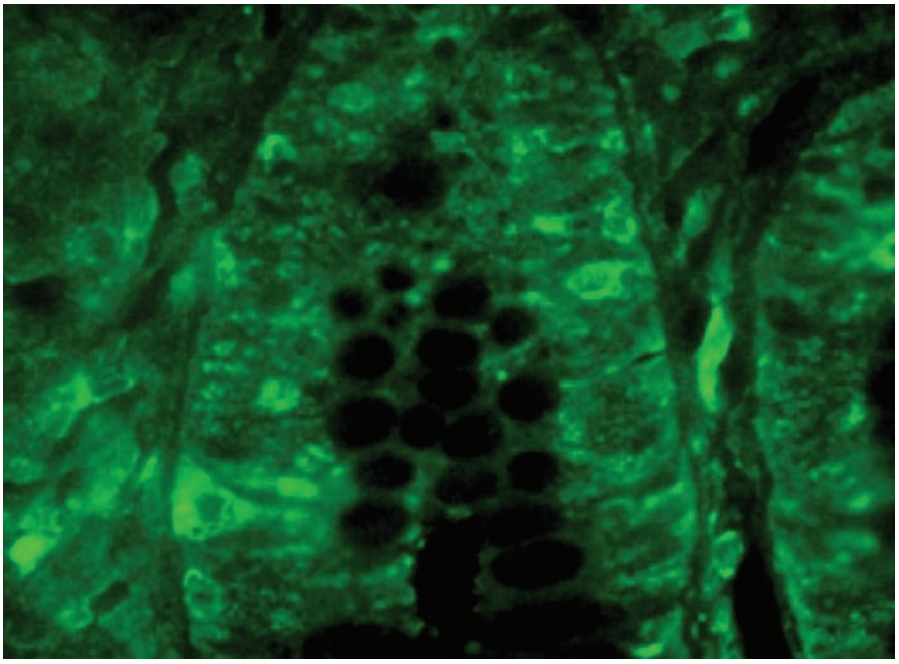
IBD

Diagnosis by proteasome pattern

The expression ratio of catalytic proteasome subunits in intestinal tissue can be exploited as a diagnostic tool to distinguish patients with ulcerative colitis (UC) from those with Crohn's disease (CD).

No serological markers exist that can accurately distinguish between CD and UC. Previous work by this group of researchers suggested that both the molecular and cellular basis of the inflammatory response differ between these conditions, and that this difference could, at least in part, be attributed to characteristic composition and function of proteasomes.

The team analyzed the composition of proteasome subunits with use of a chemically synthesized proteasome inhibitor that enables the detection of four catalytic subunits in one process. Liver and intestinal tissues obtained from healthy individuals ($n = 18$), patients with CD ($n = 19$), and patients with UC ($n = 13$) were analyzed, in addition to mouse tissue. "This is the first time a detailed proteasome analysis of the human intestine has been performed," explains Ulrich Steinhoff, who was a member of the investigative team. "The analysis revealed that tissue-specific proteasome composition applies not only to mice but also to humans." The group was able to determine ratios of β1 and β1i, and β2 and β2i subunits in various tissues. The ratio between catalytic, immune subunits and constitutive subunits was highest in the CD group compared to UC or control groups. "Inflammation in CD induces a massive upregulation of β1i and β2i in the colon and terminal ileum, which to this extent is not the case in UC," says Steinhoff. "This difference in proteasome composition can be exploited as a diagnostic tool for IBD patients."



Credit: U. Steinhoff, Max-Planck Institute for Infection Biology, Berlin, Germany

The researchers think that this type of analysis might be suitable for the diagnosis of other diseases too. "Additional studies are now needed to be performed in large, well-characterized cohorts ... to verify the potential use of proteasome patterns as a diagnostic tool," the researchers conclude.

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