Glycosylation of Thermomyces lanuginosa lipase enhances surface binding towards phospholipids, but does not significantly influence the catalytic activity - DTU Orbit (21/12/2018)

**Glycosylation of Thermomyces lanuginosa lipase enhances surface binding towards phospholipids, but does not significantly influence the catalytic activity**

Binding properties of the native Thermomyces lanuginosa lipase (Tll), the inactive mutant of Tll (S146A; active Ser146 mutated to Ala), and the non-glycosylated mutant of Tll (N33Q) were determined using fluorescence spectroscopy. Tll, S146A mutant and N33Q mutant show significant different binding behavior to phosphatidylcholine (PC) and phosphatidylglycerol (PG) liposomes. Generally, weaker association of lipase molecules is observed to PC liposomes than to PG liposomes. Strong lipase-lipid interactions are observed for the S146A mutant, which is less pronounced for Tll and the N33Q variant. Addition of fatty acid to PG liposomes reduces significantly the binding affinity of the lipases. This effect is less pronounced in fatty acid/PC liposomes. Although the catalytic activity of the N33Q mutant is comparable to Tll, the non-glycosylated variant shows generally lower binding affinity to PC or PG matrix than Tll. Addition of the substrate analog benzene boronic acid (BBA) increases the binding affinity of the S146A and N33Q mutants, while only small changes are observed for Tll suggesting that the dynamics of the active-site lid influences the binding affinity and that the flexibility of the loop region 33-48 might contribute to the activation of the lipase.

**General information**

State: Published
Organisations: Department of Chemistry, Novozymes AS, University of Helsinki
Pages: 125-134
Publication date: 2002
Peer-reviewed: Yes

**Publication information**

Journal: COLLOIDS AND SURFACES B-BIOINTERFACES
Volume: 26
Issue number: 1-2
ISSN (Print): 0927-7765
Ratings:
- BFI (2018): BFI-level 1
- Web of Science (2018): Indexed yes
- BFI (2017): BFI-level 1
- Scopus rating (2017): CiteScore 4.24 SJR 1.071 SNIP 1.101
- Web of Science (2017): Impact factor 3.997
- Web of Science (2017): Indexed yes
- BFI (2016): BFI-level 1
- Scopus rating (2016): CiteScore 4.42 SJR 1.079 SNIP 1.322
- Web of Science (2016): Impact factor 3.887
- BFI (2015): BFI-level 1
- Scopus rating (2015): CiteScore 4.26 SJR 1.085 SNIP 1.241
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 1
- Scopus rating (2014): CiteScore 4.53 SJR 1.21 SNIP 1.56
- Web of Science (2014): Impact factor 4.152
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 1
- Scopus rating (2013): CiteScore 4.64 SJR 1.267 SNIP 1.587
- Web of Science (2013): Impact factor 4.287
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 1
- Scopus rating (2012): CiteScore 3.74 SJR 1.242 SNIP 1.342
- Web of Science (2012): Impact factor 3.554
- ISI indexed (2012): ISI indexed yes
- Web of Science (2012): Indexed yes