

## Supplementary information

Epitopes identified in GAPDH from *Clostridium difficile* recognized as common antigens with potential autoimmunizing properties

Razim A. \*<sup>1</sup>, Pacyga K.<sup>1</sup>, Aptekorz M.<sup>2</sup>, Martirosian G.<sup>2</sup>, Szuba A.<sup>3,4</sup>, Pawlak-Adamska E.<sup>5</sup>, Brzychczy-Włoch M.<sup>6</sup>, Myc A.<sup>1,7</sup>, Gamian A.<sup>1</sup>, Górská S.<sup>1</sup>

<sup>1</sup> Hirszfeld Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Department of Immunology of Infectious Diseases, Laboratory of Medical Microbiology, Wrocław, Poland

<sup>2</sup> Department of Medical Microbiology, School of Medicine in Katowice, Medical University of Silesia, Katowice, Poland

<sup>3</sup> Division of Angiology, Wrocław Medical University, Wrocław, Poland

<sup>4</sup> Department of Internal Medicine, 4th Military Hospital in Wrocław, Poland

<sup>5</sup> Hirszfeld Institute of Immunology and Experimental Therapy of the Polish Academy of Sciences, Department of Experimental Therapy, Laboratory of Immunopathology, Wrocław, Poland

<sup>6</sup> Department of Molecular Medical Microbiology, Chair of Microbiology, Jagiellonian University Medical College, Krakow, Poland

<sup>7</sup> Research Associate Scientist Emeritus, University of Michigan, Nanotechnology Institute for Medicine and Biological Sciences, Ann Arbor, MI 48109, U.S.A.

Contact: [agnieszka.mehlich@iitd.pan.wroc.pl](mailto:agnieszka.mehlich@iitd.pan.wroc.pl)

Figure S1

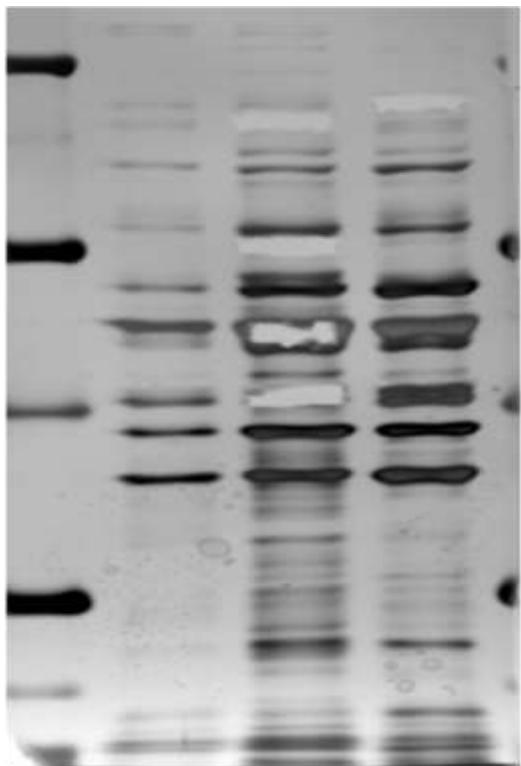


Figure S1 Uncropped gel used in Figure 1

Figure S2



Fig S2 Picture of the original blot used in Figure 1

Table S1 GAPDH as moonlighting protein.

<b>organism</b>	<b>alternative function</b>	<b>reference</b>
Escherichia coli	NAD ribosylating activity	(Aguilera i in. 2009)
Lactobacillus plantarum	binds mucin and Caco-2 cells	(Kinoshita i in. 2008)
Lactococcus lactis IL1403	binding to invertase, a hyperglycosylated mannoprotein from Saccharomyces cerevisiae	(Katakura i in. 2010)
Streptococcus anginosus and oralis	plasminogen binding	(Kinby, Booth, i Svensäter 2008)
Streptococcus pyogenes	binds uPAR/CD87 receptor on human cells	(Jin i in. 2005)
Streptococcus suis (serotype 2)	plasminogen binding	(Jobin i in. 2004)
Trichomonas vaginalis	Fibronectin, plasminogen, collagen binding	(Lama i in. 2009)
Staphylococcus epidermidis and aureus	transferrin-binding protein (also called TPN) and also binds plasminogen involved in the acquisition of transferrin-bound iron	(Modun i Williams 1999)
Streptococcus pneumoniae	plasminogen binding	(Bergmann, Rohde, i Hammerschmidt 2004)
Streptococcus agalactiae, group B, serotype III/deltaepsilon, strain J48	plasminogen binding	(Seifert i in. 2003)
Bacillus anthracis	plasminogen binding	(Matta, Agarwal, i Bhatnagar 2010)
Mycoplasma genitalium	binds mucin	(Alvarez, Blaylock, i Baseman 2003)

- Aguilera, L., Giménez, R., Badia, J., Aguilar, J. & Baldoma, L. NAD<sup>+</sup>-dependent post-translational modification of Escherichia coli glyceraldehyde-3-phosphate dehydrogenase. *Int. Microbiol. Off. J. Span. Soc. Microbiol.* **12**, 187–192 (2009).
- Alvarez, R. A., Blaylock, M. W. & Baseman, J. B. Surface localized glyceraldehyde-3-phosphate dehydrogenase of Mycoplasma genitalium binds mucin. *Mol. Microbiol.* **48**, 1417–1425 (2003).
- Bergmann, S., Rohde, M. & Hammerschmidt, S. Glyceraldehyde-3-Phosphate Dehydrogenase of Streptococcus pneumoniae Is a Surface-Displayed Plasminogen-Binding Protein. *Infect. Immun.* **72**, 2416–2419 (2004).
- Jin, H., Song, Y. P., Boel, G., Kochar, J. & Pancholi, V. Group A Streptococcal Surface GAPDH, SDH, Recognizes uPAR/CD87 as its Receptor on the Human Pharyngeal Cell and Mediates Bacterial Adherence to Host Cells. *J. Mol. Biol.* **350**, 27–41 (2005).
- Jobin, M.-C., Brassard, J., Quessy, S., Gottschalk, M. & Grenier, D. Acquisition of Host Plasmin Activity by the Swine Pathogen Streptococcus suis Serotype 2. *Infect. Immun.* **72**, 606–610 (2004).
- Katakura, Y., Sano, R., Hashimoto, T., Ninomiya, K. & Shioya, S. Lactic acid bacteria display on the cell surface cytosolic proteins that recognize yeast mannan. *Appl. Microbiol. Biotechnol.* **86**, 319–326 (2010).
- Kinnby, B., Booth, N. A. & Svensäter, G. Plasminogen binding by oral streptococci from dental plaque and inflammatory lesions. *Microbiology* **154**, 924–931 (2008).
- Kinoshita, H. *et al.* Cell surface Lactobacillus plantarum LA 318 glyceraldehyde-3-phosphate dehydrogenase (GAPDH) adheres to human colonic mucin. *J. Appl. Microbiol.* **104**, 1667–1674 (2008).
- Lama, A., Kucknoor, A., Mundodi, V. & Alderete, J. F. Glyceraldehyde-3-Phosphate Dehydrogenase Is a Surface-Associated, Fibronectin-Binding Protein of Trichomonas vaginalis. *Infect. Immun.* **77**, 2703–2711 (2009).
- Matta, S. K., Agarwal, S. & Bhatnagar, R. Surface localized and extracellular Glyceraldehyde-3-phosphate dehydrogenase of Bacillus anthracis is a plasminogen binding protein. *Biochim. Biophys. Acta BBA - Proteins Proteomics* **1804**, 2111–2120 (2010).

Modun, B. & Williams, P. The Staphylococcal Transferrin-Binding Protein Is a Cell Wall Glyceraldehyde-3-Phosphate Dehydrogenase. *Infect. Immun.* **67**, 1086–1092 (1999).

Seifert, K. N., McArthur, W. P., Bleiweis, A. S. & Brady, L. J. Characterization of group B streptococcal glyceraldehyde-3-phosphate dehydrogenase: surface localization, enzymatic activity, and protein–protein interactions. *Can. J. Microbiol.* **49**, 350–356 (2003).