

PMA & PMAxx™ Validated Bacterial Strains

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Bacterial strains used with PMA for viability PCR

Species	References
Acinetobacter baumannii	Tseng, C. C., Hsiao, P. K., Chang, K. C., Cheng, C. C., Yiin, L. M., and Hsieh, C. J. (2014). Detection of Viable Antibiotic-Resistant/Sensitive Acinetobacter baumannii in Indoor Air by Propidium Monoazide Quantitative PCR . Indoor Air. 10.1111/ina.12165
Acidovorax citrulli	Tian, Q., Feng, J. J., Hu, J., and Zhao, W. J. (2016). Selective detection of viable seed-borne Acidovorax citrulli by real-time PCR with propidium monoazide . Sci Rep 6, 35457. srep35457
Aggregatibacter actinomycetemcomitans	Sanchez, M. C., Marin, M. J., Figuero, E., Llama-Palacios, A., Leon, R., Blanc, V., Herrera, D., and Sanz, M. (2014). Quantitative real-time PCR combined with propidium monoazide for the selective quantification of viable periodontal pathogens in an in vitro subgingival biofilm model . J Periodontal Res 49, 20-28. 10.1111/jre.12073
Bacillus cereus	1) Cattani, F., Barth, V. C., Jr., Nasario, J. S., Ferreira, C. A., and Oliveira, S. D. (2016). Detection and quantification of viable Bacillus cereus group species in milk by propidium monoazide quantitative real-time PCR . J Dairy Sci. 10.3168/jds.2015-10019 2) Yang, L., Kuang, H., Liu, Y., Xu, H., Aguilar, Z. P., Xiong, Y., and Wei, H. (2016). Mechanism of enhanced antibacterial activity of ultra-fine ZnO in phosphate buffer solution with various organic acids . Environ Pollut 218, 863-869. S0269-7491(16)30710-2 3) Yu, S., Yan, L., Wu, X., Li, F., Wang, D., and Xu, H. (2017). Multiplex PCR coupled with propidium monoazide for the detection of viable Cronobacter sakazakii, Bacillus cereus, and Salmonella spp. in milk and milk products . J Dairy Sci 100, 7874-7882. S0022-0302(17)30709-9 4) Zhang, Z., Feng, L., Xu, H., Liu, C., Shah, N. P., and Wei, H. (2016). Detection of viable enterotoxin-producing Bacillus cereus and analysis of toxigenicity from ready-to-eat foods and infant formula milk powder by multiplex PCR . J Dairy Sci 99, 1047-1055. S0022-0302(15)00896-6
Bacillus sporothermodurans	Cattani, F., Ferreira, C. A., and Oliveira, S. D. (2013). The detection of viable vegetative cells of Bacillus sporothermodurans using propidium monoazide with semi-nested PCR . Food Microbiol 34, 196-201. 10.1016/j.fm.2012.12.007
Bacillus subtilis	1) Kim, S. Y., and Ko, G. (2012). Using propidium monoazide to distinguish between viable and nonviable bacteria, MS2 and murine norovirus . Lett Appl Microbiol 55, 182-188. 10.1111/j.1472-765X.2012.03276.x 2) Rawsthorne, H., Dock, C. N., and Jaykus, L. A. (2009). PCR-based method using propidium monoazide to distinguish viable from nonviable Bacillus subtilis spores . Appl Environ Microbiol 75, 2936-2939. 10.1128/AEM.02524-08

Bacteroidales fragilis	<p>1) Bae, S., and Wuertz, S. (2009). Rapid decay of host-specific fecal Bacteroidales cells in seawater as measured by quantitative PCR with propidium monoazide. <i>Water Res</i> 43, 4850-4859. 10.1016/j.watres.2009.06.053</p> <p>2) Bae, S., and Wuertz, S. (2012). Survival of host-associated bacteroidales cells and their relationship with Enterococcus spp., Campylobacter jejuni, Salmonella enterica serovar Typhimurium, and adenovirus in freshwater microcosms as measured by propidium monoazide-quantitative PCR. <i>Appl Environ Microbiol</i> 78, 922-932. 10.1128/AEM.05157-11</p> <p>3) Bae, S., and Wuertz, S. (2014). Decay of host-associated Bacteroidales cells and DNA in continuous-flow freshwater and seawater microcosms of identical experimental design and temperature as measured by PMA-qPCR and qPCR. <i>Water Res</i> 70C, 205-213. 10.1016/j.watres.2014.10.032</p> <p>4) Kim, M., Gutierrez-Cacciabue, D., Schriewer, A., Rajal, V. B., and Wuertz, S. (2014). Evaluation of detachment methods for the enumeration of Bacteroides fragilis in sediments via propidium monoazide-quantitative PCR, in comparison to Enterococcus faecalis and Escherichia coli. <i>J Appl Microbiol</i>. 10.1111/jam.12630</p>
Bacteroidales spp.	<p>1) Kim, M., and Wuertz, S. (2015). Survival and persistence of host-associated Bacteroidales cells and DNA in comparison with Escherichia coli and Enterococcus in freshwater sediments as quantified by PMA-qPCR and qPCR. <i>Water Res</i> 87, 182-192. 10.1016/j.watres.2015.09.014</p> <p>2) Varma, M., Field, R., Stinson, M., Rukovets, B., Wymer, L., and Haugland, R. (2009). Quantitative real-time PCR analysis of total and propidium monoazide-resistant fecal indicator bacteria in wastewater. <i>Water Res</i> 43, 4790-4801. 10.1016/j.watres.2009.05.031</p>
Bacteroides ovales	Dong, S., Hong, P. Y., and Nguyen, T. H. (2014). Persistence of Bacteroides ovatus under simulated sunlight irradiation . <i>BMC Microbiol</i> 14, 178. 10.1186/1471-2180-14-178
Bifidobacterium animalis	<p>1) Desfosses-Foucalt, E., Dussault-Lepage, V., Le Boucher, C., Savard, P., Lapointe, G., and Roy, D. (2012). Assessment of Probiotic Viability during Cheddar Cheese Manufacture and Ripening Using Propidium Monoazide-PCR Quantification. <i>Front Microbiol</i> 3, 350. 10.3389/fmicb.2012.00350</p> <p>2) Kramer, M., Obermajer, N., Bogovic Matijasic, B., Rogelj, I., and Kmetec, V. (2009). Quantification of live and dead probiotic bacteria in lyophilised product by real-time PCR and by flow cytometry. <i>Appl Microbiol Biotechnol</i> 84, 1137-1147. 10.1007/s00253-009-2068-7</p> <p>3) Villarreal, M. L., Padilha, M., Vieira, A. D., Franco, B. D., Martinez, R. C., and Saad, S. M. (2013). Advantageous Direct Quantification of Viable Closely Related Probiotics in Petit-Suisse Cheeses under In Vitro Gastrointestinal Conditions by Propidium Monoazide - qPCR. <i>PLoS One</i> 8, e82102. 10.1371/journal.pone.0082102</p>
Bifidobacterium breve	Fujimoto, J., Tanigawa, K., Kudo, Y., Makino, H., and Watanabe, K. (2011). Identification and quantification of viable Bifidobacterium breve strain Yakult in human faeces by using strain-specific primers and propidium monoazide . <i>J Appl Microbiol</i> 110, 209-217. 10.1111/j.1365-2672.2010.04873.x
Bifidobacterium lactis	Ganesan, B., Weimer, B. C., Pinzon, J., Dao Kong, N., Rompato, G., Brothersen, C., and McMahon, D. J. (2014). Probiotic bacteria survive in Cheddar cheese and modify populations of other lactic acid bacteria . <i>J Appl Microbiol</i> 116, 1642-1656. 10.1111/jam.12482
Bifidobacterium spp.	Khodaei, N., Fernandez, B., Fliss, I., and Karboune, S. (2016). Digestibility and prebiotic properties of potato rhamnogalacturonan I polysaccharide and its galactose-rich oligosaccharides/oligomers . <i>Carbohydr Polym</i> 136, 1074-1084. 10.1016/j.carbpol.2015.09.106

Blautia cocoides	Khodaei, N.,Fernandez, B.,Fliss, I., and Karboune, S. (2016). Digestibility and prebiotic properties of potato rhamnogalacturonan I polysaccharide and its galactose-rich oligosaccharides/oligomers . Carbohydr Polym 136, 1074-1084. 10.1016/j.carbpol.2015.09.106
Burkholderia cepacia	Rogers, G. B.,Stressmann, F. A.,Koller, G.,Daniels, T.,Carroll, M. P., and Bruce, K. D. (2008). Assessing the diagnostic importance of nonviable bacterial cells in respiratory infections . Diagn Microbiol Infect Dis 62, 133-141. 10.1016/j.diagmicrobio.2008.06.011
Burkholderia multivorans	Stokell, J. R.,Gharaibeh, R. Z., and Steck, T. R. (2013). Rapid emergence of a ceftazidime-resistant Burkholderia multivorans strain in a Cystic Fibrosis patient . J Cyst Fibros DOI: 10.1016/j.jcf.2013.01.009.
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Fusobacterium nucleatum	<p>1) Alvarez, G., Gonzalez, M., Isabal, S., Blanc, V., and Leon, R. (2013). Method to quantify live and dead cells in multi-species oral biofilm by real-time PCR with propidium monoazide. <i>AMB Express</i> 3, 1. 10.1186/2191-0855-3-1</p> <p>2) Sanchez, M. C., Marin, M. J., Figuero, E., Llama-Palacios, A., Leon, R., Blanc, V., Herrera, D., and Sanz, M. (2014). Quantitative real-time PCR combined with propidium monoazide for the selective quantification of viable periodontal pathogens in an in vitro subgingival biofilm model. <i>J Periodontal Res</i> 49, 20-28. 10.1111/jre.12073</p>
Helicobacter pylori	<p>1) Agusti, G., Codony, F., Fittipaldi, M., Adrados, B., and Morato, J. (2010). Viability determination of Helicobacter pylori using propidium monoazide quantitative PCR. <i>Helicobacter</i> 15, 473-476. 10.1111/j.1523-5378.2010.00794.x</p> <p>2) Moreno-Mesonero, L., Moreno, Y., Alonso, J. L., and Ferrus, M. A. (2017). Detection of viable Helicobacter pylori inside free-living amoebae in wastewater and drinking water samples from Eastern Spain. <i>Environ Microbiol</i> 19, 4103-4112. 10.1111/1462-2920.13856</p> <p>3) Orta de Velasquez, M. T., Yanez Noguez, I., Casasola Rodriguez, B., and Roman Roman, P. I. (2016). Effects of ozone and chlorine disinfection on VBNC Helicobacter pylori by molecular techniques and FESEM images. <i>Environ Technol</i>, 1-10. 10.1080/09593330.2016.1210680</p> <p>4) Santiago, P., Moreno, Y., and Ferrus, M. A. (2015). Identification of Viable Helicobacter pylori in Drinking Water Supplies by Cultural and Molecular Techniques. <i>Helicobacter</i>. 10.1111/hel.12205</p>
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Lactobacillus casei	<p>Ganesan, B., Weimer, B. C., Pinzon, J., Dao Kong, N., Rompato, G., Brothersen, C., and McMahon, D. J. (2014). Probiotic bacteria survive in Cheddar cheese and modify populations of other lactic acid bacteria. <i>J Appl Microbiol</i> 116, 1642-1656. 10.1111/jam.12482</p>
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Bacterial strains used with PMAxx™ for viability PCR

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