

Faculty of Science**Department of Microbiology****Curriculum Title Doctor of Philosophy Program in Microbiology (International Program)****Curriculum Description**

The Ph.D. program in Microbiology is designed to prepare internationally qualified researchers and academics with expertise and advanced level of specialized knowledge in the area of Microbiology, able to initiate, analyze, synthesize, investigate, generate innovation or novel body of knowledge in fields of microbiology and apply research to support community needs, both locally and internationally, demonstrate appropriate moral behaviors and research ethics, and able to work with others, both locally and internationally.

Type of Program

- Regular Program (Monday- Friday)
- Regular Program (Monday- Friday) and International Program
- Special Program (Saturday-Sunday)

Dissertation Themes

1. Food safety
2. Bacterial diversity
3. Antibiotic resistant in Enterobacteriaceae
4. Application of bacteria to food, agriculture and environment
5. Bacterial diseases affecting aquaculture and biological control
6. The potential use of halophilic and lactic acid bacteria in food processing
7. Development of *Vibrio vulnificus* phages as biocontrol and pathogenesis of *Vibrio vulnificus*

Prospective students

1. Plan 1
 - Plan 1.1
 1. Applicants must hold a Master's degree or be studying in the final semester of Master's level in Microbiology or in related field with a GPA of at least 3.25 and
 2. Have full paper published in the conference proceedings and
 3. Experience in conducting research or project in the area of Microbiology or in related field and
 4. Approved by graduate program administrative committee.
 - Plan 1.2
 1. Applicants must hold a Bachelor's degree with first class honor or be studying in the final semester of undergraduate level in Microbiology or in related field with a GPA of at least 3.50 and
 2. Have experience in conducting research or project in the area of Microbiology or in related field and
 3. Approved by graduate program administrative committee.
2. Plan 2
 - Plan 2.1
 1. Applicants must hold a Master's degree or be studying in the final semester of Master's level in Microbiology or in related field and
 2. Have at least 1 year of experience in conducting research or project in the area of Microbiology or in related field and
 3. Approved by graduate program administrative committee.
 - Plan 2.2
 1. Applicants must hold a Bachelor's degree or be studying in the final semester of undergraduate level in Microbiology or in related field with a GPA of at least 3.00 and
 2. Have at least 1 year of experience in conducting research or project in the area of Microbiology or in related field and
 3. Have at least 1 publication in academic journals

4. Approved by graduate program administrative committee.
3. Applicants whose native language is not English MUST achieve the minimum score of one of the following English proficiency tests:
 - TOEFL paper-based ≥ 500
 - TOEFL computer-based ≥ 173
 - TOEFL internet-based ≥ 61
 - IELTS ≥ 5.0
 - CU-TEP or PSU-TEP ≥ 60The English test score certificate must not be older than 2 years at the time of application.
4. In cases where the English qualification does not meet the requirement above, consideration by the graduate program administrative committee is required.
5. Other qualifications should conform to the requirements indicated in the Academic Regulations of Graduate Studies, Prince of Songkla University, B.E. 2556.

Prospective advisors

1. Assistant Prof. Dr. Pimonsri Mittraparp-arthorn
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2. Assistant Prof. Dr. Preeyanuch Bovornreungroj
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3. Dr. Ampaitip Sukhoom
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4. Dr. Rattanaaruji Pomwised
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Contact Information

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Education:

2005 B.Sc. (Microbiology) Prince of Songkla University, Thailand
2010 Ph.D. (Biomedical Sciences) Prince of Songkla University, Thailand

Areas of interest:

Food Safety, bacterial diseases affecting aquaculture and biological control

Award Received:

- 2010 The best Ph.D.'s Thesis Award
- 2014 Advisor of the M.Sc. student who received the best M.Sc.'s Thesis Award
- 2017 Advisor of the M.Sc. student who received the Songklanagarind Innovation Award
- 2018 Medalle D'Or Silver Medal, 46th International Exhibition of Inventions of Geneva

Publications:

1. Bangpanwimon, K., Sottisuporn, J., **Mittraparp-arthorn, P.**, Ueaphatthanaphanich, W., Rattanasupar, A., Pourcel, C. and Vuddhakul, V. 2017. CRISPR-like sequences in *Helicobacter pylori* and application in genotyping. Gut Pathogens. doi:10.1186/s13099-017-0215-8.
2. Srikong, W., Bovornreungroj, N., **Mittraparp-arthorn, P.** and Bovornreungroj, P. Antibacterial and antioxidant activities of differential solvent extractions from the green seaweed *Ulva intestinalis*. 2017. ScienceAsia. 43: 88-95.
3. Kongrueng, J., Tansila, N., **Mittraparp-arthorn, P.**, Nishibuchi, M., Vora, G.J. and Vuddhakul, V. 2015. LAMP assay to detect *Vibrio parahaemolyticus* causing acute hepatopancreatic necrosis disease in shrimp. Aquaculture International. doi: 10.1007/s10499-014-9874-3.
4. Kongrueng, J., **Mittraparp-arthorn, P.**, Bangpanwimon, K., Robins, W., Vuddhakul, V. and Mekalanos, J. Isolation of Bdellovibrio and like organisms and potential to reduce acute hepatopancreatic necrosis disease caused by *Vibrio parahaemolyticus*. 2014. Diseases of Aquatic Organisms. doi: 10.3354/dao03120.

5. Yingkajorn, M., **Mittraparp-arthorn, P.**, Nuanualsuwan, S., Poomwised, R., Kongchuay, N., Khamhaeng, N. and Vuddhakul, V. 2014. Prevalence and quantification of pathogenic *Vibrio parahaemolyticus* during shrimp culture in Thailand. *Diseases of Aquatic Organisms*. 112(2): 103-111.
6. Preeprem, S., **Mittraparp-arthorn, P.**, Bhoopong, P. and Vuddhakul, V. 2014. Isolation and characterization of *Vibrio cholerae* isolates from seafood in Hat Yai city, Songkhla, Thailand. *Foodborne Pathogens and Disease*. 11(11): 881-886.
7. Thongjun, J., **Mittraparp-arthorn, P.**, Yingkajorn, M., Kongreung, J., Nishibuchi, M. and Vuddhakul, V. 2013. The trend of *Vibrio parahaemolyticus* infections in southern Thailand from 2006 to 2010. *Tropical Medicine and Health*. 41(4): 151-156.
8. Wang, A., Lin, B., Mostaghim, A., Rubin, R.A., Glaser, E.R., **Mittraparp-arthorn, P.**, Thompson, J.R., Vuddhakul, V. and Vora, G.J. 2013. *Vibrio campbellii* hmgA-mediated pyomelanization impairs quorum sensing, virulence, and cellular fitness. *Frontiers in Microbiology*. doi: 10.3389/fmicb.2013.00379.
9. **Rattanama, P.**, Thompson, J.R., Kongkerd, N., Srinitiwawong, K., Vuddhakul, V. and Mekalanos, J.J. 2012. Sigma E regulators control hemolytic activity and virulence in a shrimp pathogenic *Vibrio harveyi*. *PLoS ONE*. doi: 10.1371/journal.pone.0032523.
10. Sukhumungoon, P., **Mittraparp-arthorn, P.**, Pomwised, R., Charernjiratrakul, W. and Vuddhakul, V. 2011. High concentration of Shiga toxin 1-producing *Escherichia coli* isolated from southern Thailand. *International Food Research Journal*. 18: 667-672.
11. Thongchankaew, U., Sukhumungoon, P., **Mitraparp-arthorn, P.**, Srinitiwawong, K., Plathong, S. and Vuddhakul, V. 2011. Diversity of *Vibrio* spp. at the Andaman Tarutao Island, Thailand. *Asian Journal of Biotechnology*. 3: 530-539.
12. Thongchankaew, U., Mittraparp-arthorn, P., Sukhumungoon, P., Tansila, N., Nuidate, T., Nishibuchi, M. and Vuddhakul, V. 2011. Occurrence of potentially pathogenic vibrios and related environmental factors in Songkhla Lake, Thailand. *Canadian Journal of Microbiology*. 57(11): 867-873.



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Research interests: Industrial Microbiology and Food Biotechnology

The main of our research are related to the potential use of microorganisms in food processing:

1. Use of halophilic bacteria and their enzymes for acceleration and enhance flavor and aroma in fermented fish sauce.
2. Use of lactic acid bacteria for starter culture in fermented rice noodle and to produce biopreservative for reduced *Listeria monocytogenes* in chilled seafood products.

Selected Publications

1. Dueramae, S., **Bovornreungroj, P.**, Enomoto, T. and Kantachote, D. 2017. Enhancement of Halophilic Lipase Production by *Virgibacillus alimentarius* LBU20907 using a Statistical Approach and Scale-Up in a Fermenter. *Walailak Journal of Science and Technology*. 14 (12): 921-939.
2. Dueramae, S., **Bovornreungroj, P.**, Enomoto, T. and D. Kantachote. 2017. Purification and characterization of an extracellular lipolytic enzyme from the fermented fish-originated halotolerant bacterium, *Virgibacillus alimentarius* LBU20907. *Chemical Papers*. 71 (10): 1975-1984.
3. Srikong, W., Bovornreungroj, N., Mittraparp-arhorn, P. and **P. Bovornreungroj**. 2017. Antibacterial and antioxidant activities of differential solvent extractions from the green seaweed *Ulva intestinalis*. *ScienceAsia*. 43 (2):88-95.
4. Chuprom, J., **Bovornreungroj, P.**, Ahmad, M., Kantachote, D. and T. Enomoto. 2016. Statistical optimization for the improved production of an extracellular alkaline nuclease by halotolerant *Allobacillus halotolerans* MSP69: Scale up approach and its potential as flavor enhancer of fish sauce. *Biocatalysis and Agricultural Biotechnology*. 8: 236-247.
5. Chuprom, J., **Bovornreungroj, P.**, Ahmad, M., Kantachote, D. and S. Dueramae. 2016. Approach toward enhancement of halophilic protease production by *Halobacterium* sp. strain LBU50301 using statistical design response surface methodology. *Biotechnology reports*. 10: 17-28.
6. Srikong, W., Mittraparp-arhorn, P., Rattanaporn, O., Bovornreungroj, N. and **P. Bovornreungroj**. 2015. Antimicrobial activity of seaweed extracts from Pattani, southeast coast of Thailand. *Food and Applied Bioscience Journal*. 3 (1): 39-49.
7. Tuntisuwanno, N., Charernjiratakul, W., Bovornreungroj, N. and **P. Bovornreungroj**. 2014. Selection of biopreservative-produced lactic acid bacteria from chilled seafood products. *Chiang Mai University Journal Natural Science*. 13 (1): 459-468.
8. Kanlayakrit, W. and **P. Bovornreungroj**. 2005. Isolation of extremely halophilic bacteria producing halophilic protease from fish sauce sample. *Kasetsart J. Nat. Sci.* 39 (1): 88-97.
9. Kanlayakrit, W., **Bovornreungroj, P.**, Oka, T. and M. Goto. 2004. Production and characterization of protease from an extremely halophilic *Halobacterium* sp. PB407. *Kasetsart J. Nat. Sci.* 38 (5): 15-20.
10. Kanlayakrit, W., Ikeda, T., Tojai, S., **Bovornreungroj, P.** and A. Boonpan. 2001. Production and characterization of extracellular halophilic ribonuclease from halotolerant *Pseudomonas* sp. *Bulletin of National Pintung University of Science and Technology*. 10 (40): 281-289.

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Education:

1987 B.Sc. (Biology) Prince of Songkla University, Thailand
1991 M.Sc. (Industrial Microbiology) Chulalongkorn University, Thailand
1999 Ph.D. (Agriculture & Biological Sciences) University of Newcastle upon Tyne, UK
2004 Certificate in Biotechnology in Agriculture: Plant & Microorganisms, The Hebrew
University of Jerusalem, Israel
2008 Certificate in Marine Biotechnology, Institute of Oceanology, Qingdao, China

Areas of interest:

Environmental microbiology

Publications:

1. Seangtumnor, N., Kantachote, D., Nookongbut, P., **Sukhoom, A.** 2018. The potential of selected purple nonsulfur bacteria with ability to produce proteolytic enzymes and antivibrio compounds for using in shrimp cultivation. *Biocatalysis and Agricultural Biotechnology*. 14: 138-144.
2. Khuong, N.Q., Kantachote, D., Onthong, J., **Sukhoom, A.** 2018. Al³⁺ and Fe²⁺ toxicity reduction potential by acid-resistant strains of *Rhodospseudomonas palustris* isolated from acid sulfate soils under acidic conditions. *Annals of Microbiology*. 68: 217-228.
3. Zhang, Q., Oh, M., Kim, J.-H., Kanjanasuntree, R., Konkit, M., **Sukhoom, A.**, Kantachote, D., Kim, W. 2018. *Arthrobacter paludis* sp. Nov., isolated from a marsh *International Journal of Systematic and Evolutionary Microbiology*.
4. Khuong, N.Q., Kantachote, D., Onthong, J., **Sukhoom, A.** 2017. The potential of acid-resistant purple nonsulfur bacteria isolated from acid sulfate soils for reducing toxicity of Al³⁺ and Fe²⁺ using biosorption for agricultural application. *Biocatalysis and Agricultural Biotechnology*. 12: 329-340.
5. Kantachote, D., Ratanaburee, A., Hayisama-ae, W., **Sukhoom, A.**, Nunkaew, T. 2017. The use of potential probiotic *Lactobacillus plantarum* DW12 for producing a novel functional beverage from mature coconut water. *Journal of Functional Foods*. 32: 401-408.

6. Kantachote, D., Ratanaburee, A., **Sukhoom, A.**, Sumpradit, T., Asavaroungpipop, N. 2016. Use of γ -aminobutyric acid producing lactic acid bacteria as starters to reduce biogenic amines and cholesterol in Thai fermented pork sausage (Nham) and their distribution during fermentation. *Food Science and Technology* 70: 171-177.
7. Kim, W., Siamphan, C., Kim, J. H., **Sukhoom, A.** 2015. *Oceanobacillus arenosus* sp. nov., a moderately halophilic bacterium isolated from marine sand. *International Journal of Systematic and Evolutionary Microbiology*. 65: 2943-2948.
8. Kang, H., Weerawongwiwat, V., Kim, J.H., **Sukhoom, A.**, Kim, W. 2013. *Bacillus songklensis* sp. nov., isolated from soil. *International Journal of Systematic and Evolutionary Microbiology*. 63: 4189-4195.
9. Ratanaburee, A., Kantachote, D., Charernjiratrakul, W., **Sukhoom, A.** 2013. Enhancement of γ -aminobutyric acid (GABA) in Nham (Thai fermented pork sausage) using starter cultures of *Lactobacillus namurensis* NH2 and *Pediococcus pentosaceus* HN8. *International Journal of Food Microbiology*. 167: 170-176.
10. Ratanaburee, A., Kantachote, D., Charernjiratrakul, W., **Sukhoom, A.** 2013. Selection of γ -aminobutyric acid-producing lactic acid bacteria and their potential as probiotics for use as starter cultures in Thai fermented sausages (Nham). *International Journal of Food Science and Technology*. 48: 1371-1382.
11. Kim, W., Traiwan, J., Park, M.H., Jung, M.Y. and Oh, S.J. Yoon, J.-H., **Sukhoom, A.** 2012. *Chungangia koreensis* gen. nov., sp. nov., isolated from marine sediment. *International Journal of Systematic and Evolutionary Microbiology*. 62: 1914-1920.
12. Amornpitoksuk, P., Suwanboon, S., Sangkanu, S., **Sukhoom, A.**, Muensit, N., Baltrusaitis, J. 2012. Synthesis, characterization, photocatalytic and antibacterial activities of Ag-doped ZnO powders modified with a diblock copolymer. *Powder Technology*. 219: 158-164.
13. Amornpitoksuk, P., Suwanboon, S., Sangkanu, S., **Sukhoom, A.**, Muensit, N. 2012. Morphology, photocatalytic and antibacterial activities of radial spherical ZnO nanorods controlled with a diblock copolymer. *Superlattices and Microstructures*. 51: 103-113.
14. Amornpitoksuk, P., Suwanboon, S., Sangkanu, S., **Sukhoom, A.**, Wudtipan, J., Srijan, K., Kaewtaro, S. 2011. Synthesis, photocatalytic and antibacterial activities of ZnO particles modified by diblock copolymer. *Powder Technology*. 212: 432-438.
15. Cho, S. L., Nam, S. W., Yoon, J. H., Lee, J. S., **Sukhoom, A.**, Kim, W. 2008. *Lactococcus chungangensis* sp. nov., a lactic acid bacterium isolated from activated sludge foam. *International Journal of Systematic and Evolutionary Microbiology*. 58:1844-1849.
16. Thaithongnum S., Ratanama P., Weeradechapol K., **Sukhoom A.**, Vuddhakul, V. 2006. Detection of *V. harveyi* in postlarvae and hatchery tank water by the MPN technique with PCR. *Aquaculture*. 261: 1-9.

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1999 Ph.D. (Agriculture & Biological Sciences) University of Newcastle upon Tyne, UK
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2008 Certificate in Marine Biotechnology, Institute of Oceanology, Qingdao, China

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Environmental microbiology

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1. Seangtumnor, N., Kantachote, D., Nookongbut, P., **Sukhoom, A.** 2018. The potential of selected purple nonsulfur bacteria with ability to produce proteolytic enzymes and antivibrio compounds for using in shrimp cultivation. *Biocatalysis and Agricultural Biotechnology*. 14: 138-144.
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5. Kantachote, D., Ratanaburee, A., Hayisama-ae, W., **Sukhoom, A.**, Nunkaew, T. 2017. The use of potential probiotic *Lactobacillus plantarum* DW12 for producing a novel functional beverage from mature coconut water. *Journal of Functional Foods*. 32: 401-408.

6. Kantachote, D., Ratanaburee, A., **Sukhoom, A.**, Sumpradit, T., Asavaroungpipop, N. 2016. Use of γ -aminobutyric acid producing lactic acid bacteria as starters to reduce biogenic amines and cholesterol in Thai fermented pork sausage (Nham) and their distribution during fermentation. *Food Science and Technology* 70: 171-177.
7. Kim, W., Siamphan, C., Kim, J. H., **Sukhoom, A.** 2015. *Oceanobacillus arenosus* sp. nov., a moderately halophilic bacterium isolated from marine sand. *International Journal of Systematic and Evolutionary Microbiology*. 65: 2943-2948.
8. Kang, H., Weerawongwiwat, V., Kim, J.H., **Sukhoom, A.**, Kim, W. 2013. *Bacillus songklensis* sp. nov., isolated from soil. *International Journal of Systematic and Evolutionary Microbiology*. 63: 4189-4195.
9. Ratanaburee, A., Kantachote, D., Charernjiratrakul, W., **Sukhoom, A.** 2013. Enhancement of γ -aminobutyric acid (GABA) in Nham (Thai fermented pork sausage) using starter cultures of *Lactobacillus namurensis* NH2 and *Pediococcus pentosaceus* HN8. *International Journal of Food Microbiology*. 167: 170-176.
10. Ratanaburee, A., Kantachote, D., Charernjiratrakul, W., **Sukhoom, A.** 2013. Selection of γ -aminobutyric acid-producing lactic acid bacteria and their potential as probiotics for use as starter cultures in Thai fermented sausages (Nham). *International Journal of Food Science and Technology*. 48: 1371-1382.
11. Kim, W., Traiwan, J., Park, M.H., Jung, M.Y. and Oh, S.J. Yoon, J.-H., **Sukhoom, A.** 2012. *Chungangia koreensis* gen. nov., sp. nov., isolated from marine sediment. *International Journal of Systematic and Evolutionary Microbiology*. 62: 1914-1920.
12. Amornpitoksuk, P., Suwanboon, S., Sangkanu, S., **Sukhoom, A.**, Muensit, N., Baltrusaitis, J. 2012. Synthesis, characterization, photocatalytic and antibacterial activities of Ag-doped ZnO powders modified with a diblock copolymer. *Powder Technology*. 219: 158-164.
13. Amornpitoksuk, P., Suwanboon, S., Sangkanu, S., **Sukhoom, A.**, Muensit, N. 2012. Morphology, photocatalytic and antibacterial activities of radial spherical ZnO nanorods controlled with a diblock copolymer. *Superlattices and Microstructures*. 51: 103-113.
14. Amornpitoksuk, P., Suwanboon, S., Sangkanu, S., **Sukhoom, A.**, Wudtipan, J., Srijan, K., Kaewtaro, S. 2011. Synthesis, photocatalytic and antibacterial activities of ZnO particles modified by diblock copolymer. *Powder Technology*. 212: 432-438.
15. Cho, S. L., Nam, S. W., Yoon, J. H., Lee, J. S., **Sukhoom, A.**, Kim, W. 2008. *Lactococcus chungangensis* sp. nov., a lactic acid bacterium isolated from activated sludge foam. *International Journal of Systematic and Evolutionary Microbiology*. 58:1844-1849.
16. Thaithongnum S., Ratanama P., Weeradechapol K., **Sukhoom A.**, Vuddhakul, V. 2006. Detection of *V. harveyi* in postlarvae and hatchery tank water by the MPN technique with PCR. *Aquaculture*. 261: 1-9.

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Education:

Year	Degree	Major	Institute	Nation
2550	Ph.D (Doctor of Philosophy)	Microbiology	Montana State University	USA
2538	B.Sc (Science)	Microbiology	Prince of Songkla University	Thailand

Special Interest: Bacteriology (pathogenesis), Bacteriophages

Research:

1. Molecular characteristic of *Vibrio vulnificus* isolated from sea food and patients
2. Use of Bacteriophage against *Vibrio vulnificus* in contaminated frozen shrimps
3. Antibiotic resistance in *Enterobacteriaceae* isolated from clinical specimens

Publication:

1. Jutharat, H., Musthafa, K., **Pomwised, R.**, Voravuthikunchai, V. 2016. Effects of *Rhodomyrtus tomentosa* Extract on Killing Activity of Human Neutrophils and Membrane Integrity of Enterohaemorrhagic *Escherichia coli* O157:H7. *Molecules* 27;21(6).
2. **Rattanaruji, P.**, Intamaso, U., Teintze, M., Young, M., Pincus, S. 2016. Coupling Peptide Antigens to Virus-Like Particles or to Protein Carriers Influences the Th1/Th2 Polarity of the Resulting Immune Response. *Vaccines (Basel)* 25;4(2).

3. Sukhumungoon, P., Mittraparp-arthorn, P., **Pomwised, R.**, Chareunjiratragul, W. and Vuddhakul, V. 2011. High concentration of shiga toxin 1-producing *Escherichia coli* isolated from southern Thailand. *Int. Food. Res. J.* 18:667.
4. Rattanama, P., Srinitiworawong, K., **Pomwised, R.**, Supamattaya, K., Vuddhakul, V. 2016. Investigation of shrimp pathogenicity, hemolysis and the presence of hemolysin and TTSS genes in *Vibrio harveyi* isolated from Thailand. *Dis. Aqua. Org.* 88:113-122.
5. Wootipoom, N., Bhoopong, P., **Pomwised, R.**, Nishibuchi, M., Ishibashi, M., Vuddhakul, V. (2007). A decrease in the proportion of infections by pandemic *Vibrio parahaemolyticus* in Hat Yai Hospital, southern Thailand. *J Med Microbiol* 56: 1630-1638.
6. Bhoopong, P., Palittapongarnpim, P., **Pomwised, R.**, Kiatkittipong, A., Kamruzzaman, M., Nakaguchi, Y., Nishibuchi, M., Ishibashi, M., Vuddhakul, V. (2007). Variability of Properties of *Vibrio parahaemolyticus* Strains Isolated from Individual Patients. *J. Clin. Microbiol.* 45: 1544-1550.