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Primary Research Interest:	Microbiology
Description of Research:	In the gram-negative bacterial pathogen <i>P. mirabilis</i> , the ability to both establish and maintain these urinary tract infections is directly related to two properties: (i) the ability to differentiate into swarmer cells, and (ii) the ability to form an ascending crystalline biofilm on the catheter that ultimately reaches the bladder. My current Merit Review focuses on a novel cell-to-cell signaling pathway that controls the differentiation of vegetative rod cells to swarmer cells. This differentiation is critical to swarming, and, in turn, for the ability to express genes required for virulence and biofilm formation. Therefore, this cell-to-cell signaling pathway may represent an "achilles heel" for the development of strategies to block virulence and biofilm formation.
Relevance to VA:	<i>P. mirabilis</i> urinary tract infections (including prostatitis) affect a large percentage of our veteran population, particularly in elderly patients and those with spinal cord injuries. These infections can be debilitating and once established can be extremely difficult to treat. Since our elderly veteran population is predicted to undergo a significant expansion in the coming years, urinary tract infections due to <i>P. mirabilis</i> will likely exhibit a corresponding increase in frequency, compounding an already serious problem.