

Direct drug target-to-drug discovery approach for combating microbial pathogen, *Vibrio vulnificus*

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Despite great efforts on elucidating genomics of microbial pathogens for possible discovery of antibacterials, there still exist a notable gap between genomics and actual drug discovery. Thus, we report a direct drug target-to-drug discovery approach using genome-scale metabolic network. We applied this approach to human pathogen *Vibrio vulnificus* CMCP6. We first reconstructed the genome-scale metabolic network of *V. vulnificus*, named VvuMBEL943. Drug targets were then predicted by metabolite essentiality analysis. Initial set of the predicted metabolites was further filtered with additional criteria based on organism specificity and maximal disruptive damage to the cell, and final drug targets were experimentally validated. Finally, structural analogs were prepared for subsequent high-throughput screening. [This work was supported by the Korean Systems Biology Research Project (20110002149) of the Ministry of Education, Science and Technology (MEST) through the National Research Foundation of Korea. Further support by the World Class University Program (R32-2008-000-10142-0) through the National Research Foundation of Korea funded by the MEST is appreciated.]