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(71) Applicant *(for all designated States except US)*: **PRESIDENT AND FELLOWS OF HARVARD COLLEGE** [US/US]; 17 Quincy Street, Cambridge, MA 02138 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **MYERS, Andrew, G.** [US/US]; 41 Braddock Park, #2, Boston, MA 02116 (US). **HERZON, Seth, B.** [US/US]; 28 Wendell Street, Apt 4., Cambridge, MA (US). **WULFF, Jeremy, Earle** [CA/CA]; 45A McPhedran Rd. S., Campbell River, BC,, V9W 8B1 (CA). **SIEGRIST, Romain** [CH/US]; 217 Willow Avenue, Somerville, MA 02144 (US). **SVENDA, Jakub** [CZ/US]; 208A Holden Street, Cambridge, MA 02138 (US). **ZAJAC, Matthew, Allen** [US/US]; 5016 Peach Blossom Dr., Douglassville, PA 19518 (US).

(74) Agent: **BAKER, Hunter, C.**; Choate, Hall & Stewart, Two International Place, Boston, MA 02110 (US).

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(54) Title: SYNTHESIS OF AVRAINVILLAMIDE, STEPHACIDIN B, AND ANALOGUES THEREOF

(57) Abstract: The syntheses of the natural products, avrainvillamide and stephacidin B, are provided. The α,β-unsaturated nitrone functionality of avrainvillamide and its 3- alkylidene-3*H*-indole 1 -oxide core is shown to covalently and reversibly bond to heteroatom-based nucleophiles. This capability may allow these molecules to bind active site nucleophiles and may provide the basis for designing potent and selective enayme inhibitors. Both avrainvillamide and its dimer stephacidin B have been reported to exhibit antiproliferative activity, and avrainvillamide has been reported to exhibit antimicrobial activity against multi-drug resistant bacteria. Avrainvillamide has been found to target cytoskeleton-linking membrane protein (CLIMP-63) thereby preventing cells from undergoing mitosis. The invention provides syntheses of these natural products as well as analogs of these natural products and their functional cores. The compounds of the invention may be used in the treatment of diseases such as cancer, autoimmune diseases, and bacterial infection.

WO 2006/102097 A3