Anothai Konkhum 2014: Formal Synthesis of (±)Cladoniamide G and Synthesis of Biologically Active Compounds against the H5N1 Bird Flu Virus. Master of Science (Chemistry), Major Field: Chemistry, Department of Chemistry.
Thesis Advisor: Mr. Paiboon Ngernmeesri, Ph.D. 111 pages.

Andersen group reported the isolation of cladoniamides A-G from cultures of the novel actinomycete *Streptomyces uncialis* harbored within the lichen *Cladonia uncialis* collected near Pitt River, British Columbia. Cladoniamide G is an indolocarbazole alkaloid, which is structurally similar to staurosporine and rebeccamycin. The biological activities of staurosporine and rebeccamycin have made them high-profile lead compounds for the development of anticancer drugs, and several analogues have entered clinical trials. Of the cladoniamide family, cladoniamide G showed the best *in vitro* cytotoxicity against human breast cancer MCF-7 cells at 10 μg/mL (23 μM).

3-Methoxy-1*H*,1'*H*-2,2'-bisindole (**26**) was the key intermediate for the synthesis of (±)-cladoniamide G'. This key intermediate was prepared in good yield by a Suzuki cross-coupling reaction of bromoindole **187** and indolyl boronic acid **189** in the presence of catalytic amount of $PdCl_2(PPh_3)_2$.

H5N1 is a highly pathogenic causative agent of H5N1 flu, commonly known as avian influenza ("bird flu"). Generally, oseltamivir drug has been use for the treatment of this fluBased on computational data, we have found some new compounds that can bind to the influenza neuraminidase better than oseltamivir. Therefore, we are attempting to synthesize these compounds for biological testing. A precursor for the synthesis of these compounds, 1(2*H*)-phenanthrenone 3,4-dihydro-6,10-dimethoxy,-amine (**201**) has been synthesized in 6 steps with 55% overall yield from 4-methoxyphenylacetic acid and 1,3-cyclohexanedione.

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