

# Collagen-Induced Platelet Aggregation Inhibitor from Mosquito Salivary Glands

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## Technology description

Exposed collagen in injured blood vessels provides a substrate for platelets to adhere and aggregate initiating the first step in thrombosis, the formation of blood clots inside a blood vessel. Despite the essential role of platelets in vascular injury, excessive platelet aggregation may also result in thrombotic diseases such as stroke and heart attack.

Available for licensing is a collagen binding protein, named aegyptin, which selectively inhibits collagen-platelet aggregation, but not platelet aggregation induced by other agonists. Collagen initiates recruitment of circulating platelets and triggers platelet activation. Collagen also plays a critical role in angiogenesis. Aegyptin blocks the interaction of collagen with its major ligands, von Willebrand factor, glycoprotein VI (GPVI), and integrin  $\alpha 2\beta 1$ . These three ligands are of particular importance because von Willebrand factor plays a critical role in tethering platelets to collagen, GPVI is the major signaling platelet receptor, and integrin  $\alpha 2\beta 1$  mediates platelet adhesion and contributes to activation. Since these ligands play a critical role in the early stages of thrombus formation, aegyptin represents a potentially highly effective therapeutic that can prevent and treat patients with thrombotic disease. Alternatively, aegyptin is potentially useful in conditions where collagen plays a critical role in angiogenesis or in conditions where excessive deposition of collagen plays a pathological role (e.g., pancreatic carcinoma).

### Market:

Thrombolytic/antithrombotic therapies are worth billions of dollars, common therapeutics include heparin, warfarin, and plasminogen activators.

Anticancer and antiangiogenic therapies.

Cardiac disease is the number one cause of death in the U.S.

Pancreatic cancer is one of the most lethal cancers, where only 23% patients will survive after one year of diagnosis, and 4% survive after five years of diagnosis.

An estimated 37,170 Americans will be newly diagnosed with pancreatic cancer in 2007.

An estimated 33,370 deaths from pancreatic cancer in the U.S. in 2007.

Pancreatic cancer is the fourth leading cause of cancer death in the U.S.

## Application area

Adjuvant to “Clot busting” therapeutics.

Method to prevent and/or treat cardiovascular/thrombotic disease.

Method to treat patients undergoing invasive cardiovascular procedures (e.g., angioplasty).

Model to study collagen-dependent platelet aggregation or collagen-mediated angiogenesis.

## Advantages

Highly effective therapeutics can negatively modulate thrombosis in its early stages by preventing collagen interaction with three major ligands involved in thrombus/clot formation.

Aegyptin’ s potential use as a prototype for drug delivery as an oral therapeutic, which can reduce the need for invasive surgeries that dilate blood vessels such as stents or catheters.

## Institution

[NIH - National Institutes of Health](#)

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