

# An Endogenous Anti-angiogenic Protein (EAP) and its Derivatives for Treatment of Cerebral Cavernous Malformations (CCM)

Tech ID: 27312 / UC Case 2016-214-0

## BACKGROUND

Cerebral cavernous malformation (CCM) is a neurovascular disease that causes epilepsy and stroke for which there is no medical therapy. It has a prevalence of 5 per thousand in western populations and occurs in familial forms as a consequence of mutations in 3 CCM genes: *CCM1/KRIT1*, *CCM2*, *CCM3/PCDC10* resulting in the formation of CCMs; mutations in the *CCM1/KRIT1* gene account for 40% of the inherited cases. Once identified, CCM patients have a lifetime risk of CCM development and progression with increasing risk of stroke, epilepsy, or neurological impairment.

## TECHNOLOGY DESCRIPTION

EAP is involved in the maintenance of vascular structure and homeostasis. Researchers at UC San Diego found that upon mutation of *CCM1/KRIT1* gene, EAP expression is suppressed. Replacement of EAP is a novel potential therapy for CCM disease. Moreover, recombinant fragments of EAP have been shown to be therapeutic in a mouse CCM model of the disease.

## APPLICATIONS

Recombinant EAP, its analogues, or derivatives offer potential therapies to prevent CCM lesion development and progression.

## ADVANTAGES

Prior studies have shown that administration of recombinant EAP and/or its analogues are feasible in animal models and one Phase I testing in humans resulted in no serious adverse reactions, demonstrating that EAP-based therapies are feasible and that ultimately small molecule orally-available agents that mimic EAP may be developed to treat these patients.

## INTELLECTUAL PROPERTY INFO

A provisional patent has been submitted.

## RELATED MATERIALS

- ▶ Lopez-Ramirez MA, Fonseca G, Zeineddine HA, Girard R, Moore T, Pham A, Cao Y, Shenkar R, de Kreuk BJ, Lagarrigue F, Lawler J, Glass CK, Awad IA, Ginsberg MH . Thrombospondin1 (TSP1) replacement prevents cerebral cavernous malformations. *J Exp Med*. 2017 Nov 6;214(11):3331-3346. doi: 10.1084/jem.20171178. Epub 2017 Sep 28. - 11/06/2017

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20190111111	04/18/2019	2016-214
Patent Cooperation Treaty	Published Application	2017180841	10/19/2017	2016-214

## CONTACT

University of California, San Diego  
Office of Innovation and Commercialization  
[innovation@ucsd.edu](mailto:innovation@ucsd.edu)  
tel: 858.534.5815.



## OTHER INFORMATION

### KEYWORDS

Endogenous Anti-Angiogenic protein (EAP), Cerebral cavernous malformation (CCM), epilepsy, stroke, neurovascular disease

### CATEGORIZED AS

- ▶ **Medical**
  - ▶ Disease: Cardiovascular and Circulatory System
  - ▶ Therapeutics

### RELATED CASES

2016-214-0

**University of California, San Diego**  
**Office of Innovation and Commercialization**  
9500 Gilman Drive, MC 0910, ,  
La Jolla, CA 92093-0910

Tel: 858.534.5815  
innovation@ucsd.edu  
<https://innovation.ucsd.edu>  
Fax: 858.534.7345

© 2016 - 2019, The  
Regents of the University of  
California  
[Terms of use](#)  
[Privacy Notice](#)