

Apollonian Biosystems

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Vision and Value Proposition

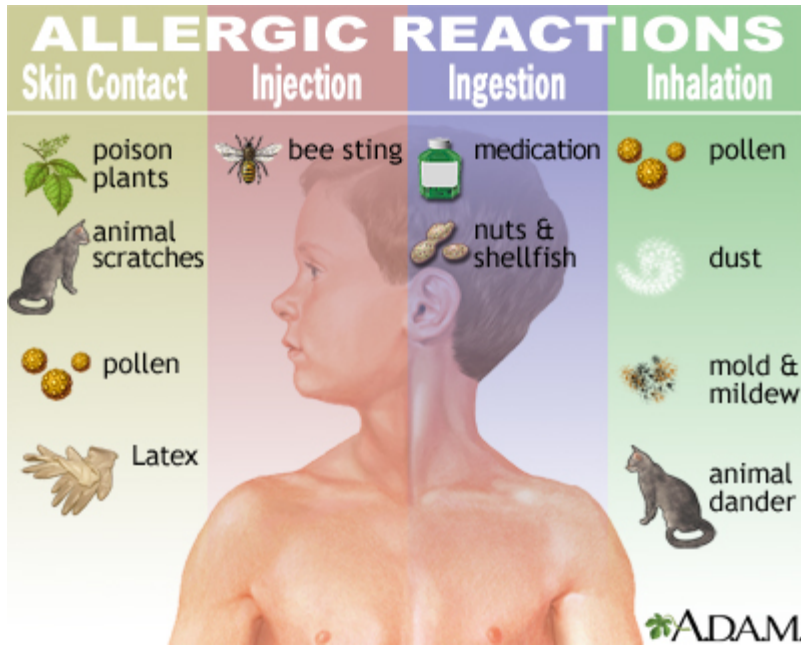
*“Allergy Tests for Age of Precision
Medicine”*

Human cultured mast cell system as
platform for blood-based allergy tests
and preclinical drug screening for
allergic side effects

Background

Allergy


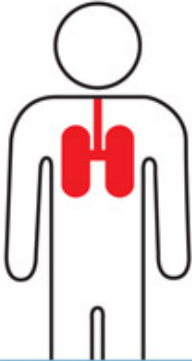

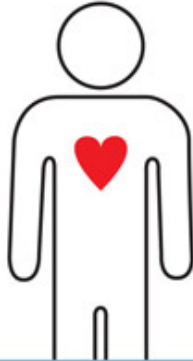

- Allergens: proteins, food, drugs, household chemicals
- Human immune system



Picture sources: MedlinePlus, NIH, U.S.; The Hong Kong Allergy Association

Background

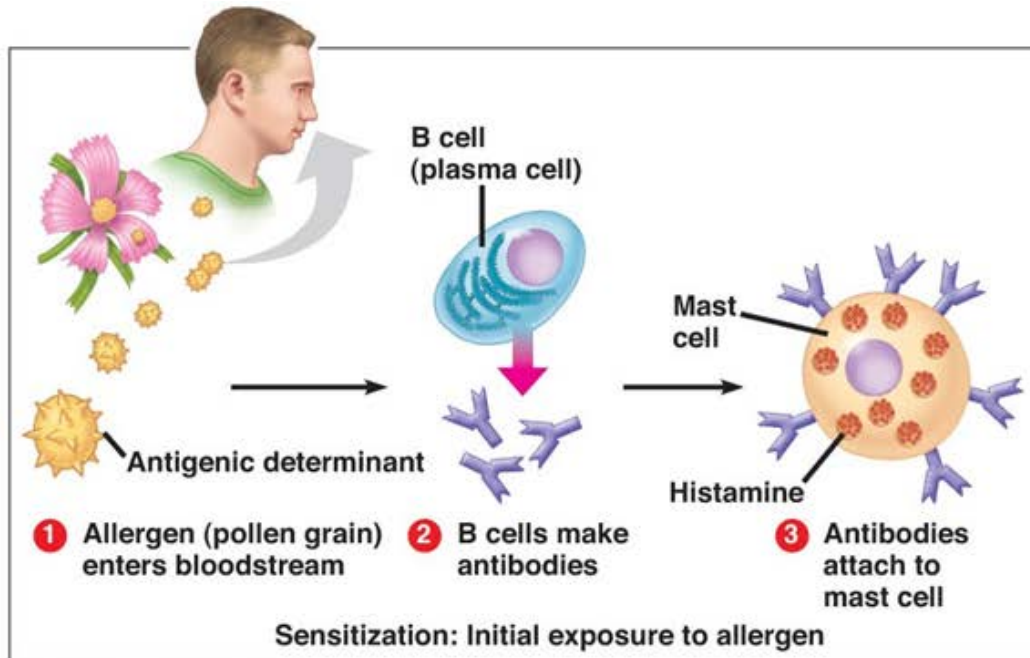
Allergy

				
SKIN	RESPIRATORY	GASTROINTESTINAL	CARDIOVASCULAR	NEUROLOGICAL
hives, swelling, itching, warmth, redness	coughing, wheezing, shortness of breath, chest pain or tightness, throat tightness, trouble swallowing, hoarse voice, nasal congestion or hay fever-like symptoms, (sneezing or runny or itchy nose; red, itchy or watery eyes)	nausea, stomach pain or cramps, vomiting, diarrhea	dizziness/ lightheadedness, pale/blue colour, weak pulse, fainting, shock, loss of consciousness	anxiety, feeling of “impending doom” (feeling that something really bad is about to happen), headache
				OTHER
				uterine cramps

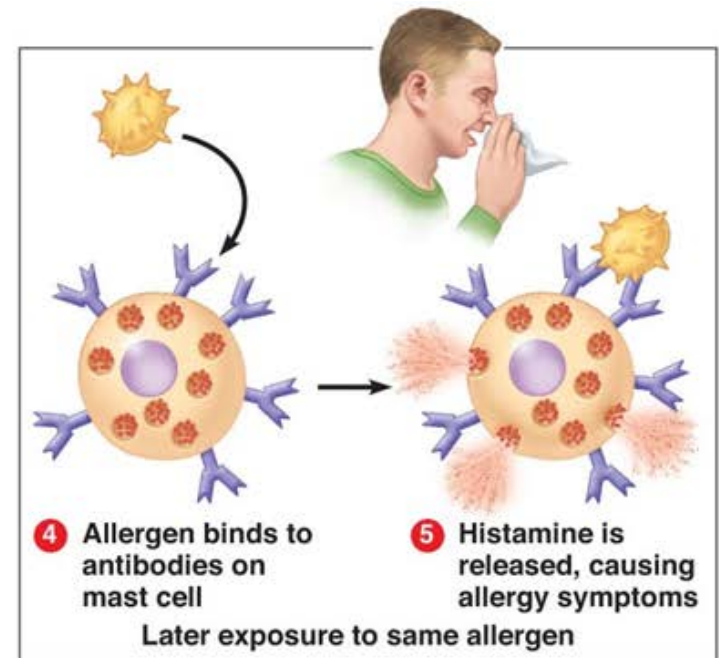
Background

Allergy

Sensitization phase

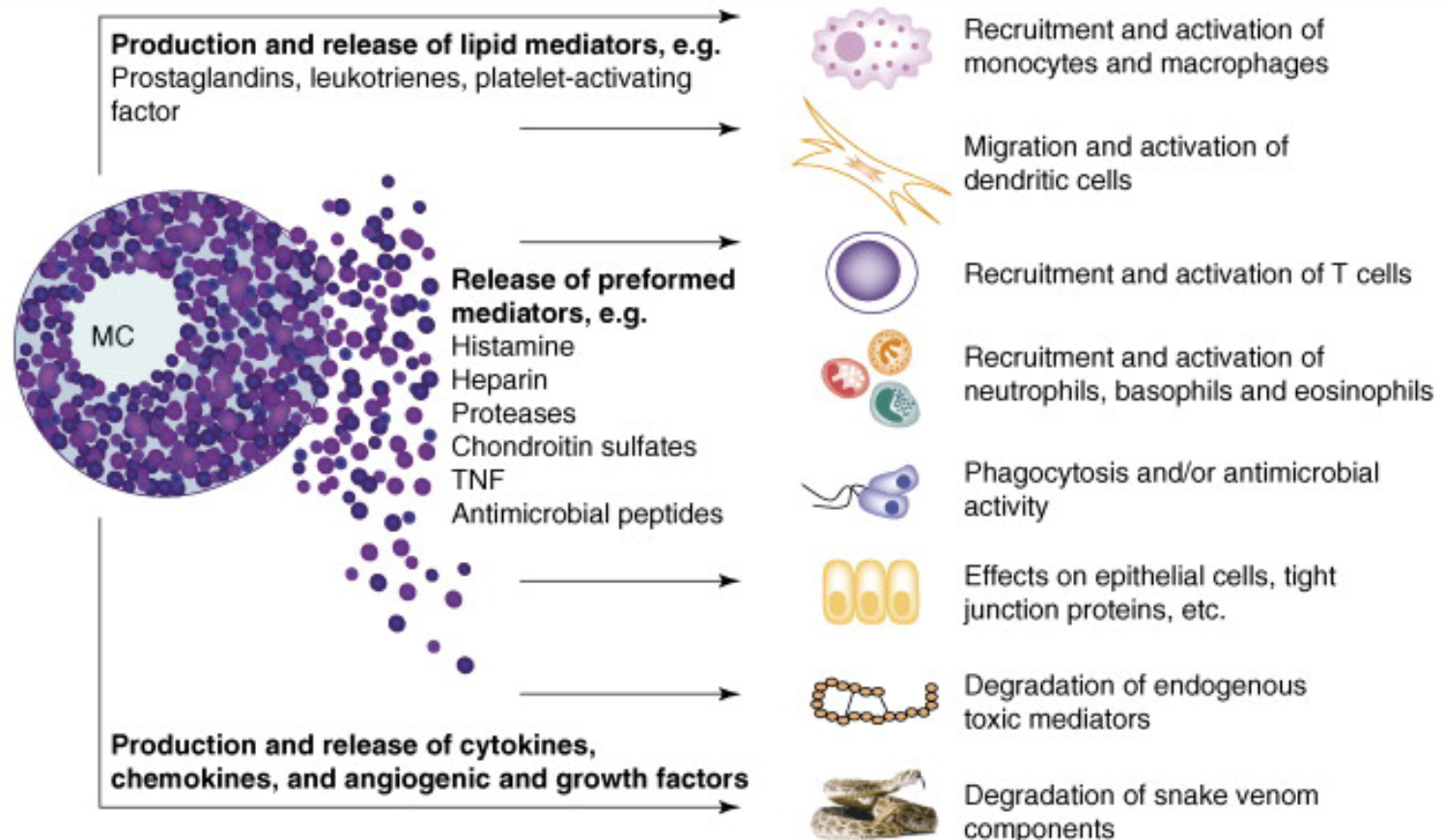


Effector phase



Background

Mast cell 肥大细胞



The Problems

- A. 因为遗传和后天因素
许多正常人和过敏患者都容易受到严重的过敏反应
- B. 大约**17%**的普通人群可能患有“肥大细胞活化综合征”，目前尚无诊断测试。
- C. 许多新药在临床试验中可能有严重的过敏反应副作用

Target Market and Opportunity

- A. Allergy affects 30% of adults and 40% of children in the U.S.
- B. Severe cases of allergic reactions result in anaphylaxis which can be fatal
- C. Many patients suffer from “mast cell activation syndrome” without correct diagnosis and thus receive improper treatment
- D. Allergy costs at least \$50 billion in health care expenses each year
- E. The global allergy diagnostics market will reach \$5.34 billion by 2021 increasing at a rate of 12.4% each year from 2016
- F. Current allergy tests such as skin prick test or IgE measurement are not fully reliable
- G. Many chemical and biologic drugs tested in clinical trials can have serious side effects of causing severe drug-induced allergic reactions
- H. Our products and services are in line with the recent development of Precision Health and Precision Medicine for the practice of medicine in the next century

The Solutions (A)

1) 新的体外肥大细胞活化过敏试验用于鉴别正常个体和过敏症患者敏感的过敏原 (敏感期: 诊断和个性化治疗)

(2) 血基肥大细胞活化过敏试验确定/预测正常人和过敏患者在精确健康状况下对严重免疫学过敏反应的敏感性 [执行阶段: 诊断和个性化的预防和治疗]

The Solutions (B)

(3) 血基肥大细胞活化过敏试验诊断 "肥大细胞活化综合征" 在精密医学 (诊断和个性化治疗) 的背景下

(4) 抗炎/抗过敏的筛选应用单捐献人肥大细胞平台对临床前铅药物候选者的治疗效果及肥大细胞活化作用的研究 [个性化治疗]

Precision Medicine [Personalized treatment]

Revenue Model/Business model

- A. We provide allergy tests for allergic patients who want to know which allergens they are allergic to using our human mast cell platform
- B. We provide allergy tests for healthy individuals and allergic patients who want to know their susceptibility to severe/fatal allergic reactions using our human mast cell platform
- C. We provide allergy tests for patients with suspected “mast cell activation syndrome” using our human mast cell platform
- D. We provide screening services for profiling of (a) preclinical lead drug candidates (b) Traditional Chinese Medicine (TCM) herbal extracts (c) cosmetics (d) food products for their mast cell-activating allergic potential of side effects using our human mast cell platform

Partnerships

- A. We have been collaborating with Professor Alaster Hang-Yung Lau at The Chinese University of Hong Kong since 2009. We have successfully obtained funding from Innovation Technology Fund (ITF) from the Hong Kong Government to support our prototype development

- B. We have been in strategic alliance with DiagCor Bioscience (Hong Kong) since 2015 to develop our allergy test prototype by being corporate co-sponsors for the ITF funding

Traction and Validation/Roadmap (1)

2008 Apollonian Biosystems founded by Dr. See-Ying Tam using private funds from his family

2009 – 2012: Developed a novel 6-week protocol for generating large populations of homogenous and functional primary human mast cells with The Chinese University of Hong Kong using funding provided by Innovation and Technology Fund (Hong Kong)

2009 – 2014: Provided drug screening services to several pharmaceutical and cosmetic companies in the U.S.

2015 – present: Entered a strategic alliance with DiagCor Bioscience (Hong Kong)

2015 – 2016: Initiation of development of prototype for our blood-based mast cell activation allergy test

Traction and Validation/Roadmap (2)

2015 – 2016: Initiation of our development of prototype for blood-based mast cell activation allergy test

2017 – present: Funding provided by Innovation and Technology Fund (Hong Kong) and continuation of our development of prototype for blood-based mast cell activation allergy test

2017 – present: Collaboration with Dr. Tak-Hong Lee at the Hong Kong Sanatorium Hospital for human allergic patient studies using our prototype tests

2018: September 2018: Completion of our prototype development and filing of U.S. patent application for our prototype

Marketing and Sales Strategy

- A. We will test the market by offering the two allergy tests for both healthy and allergic patients in Hong Kong using our strategic alliance with DiagCor, which has the most extensive diagnostics market in Hong Kong
- B. We will validate our prototypes in our laboratory in the U.S. and then launch the tests in Silicon Valley
- C. We will offer drug screening services to pharmaceutical, biotech, food, cosmetics and TCM companies around the world using the lab facility at DiagCor in Hong Kong as an additional collaborative effort for our strategic alliance with DiagCor

Team

Management team:

Dr. See-Ying Tam, President, Apollonian Systems (U.S. and Hong Kong) and Senior Research Scientist, Stanford University School of Medicine

Dr. Issan Yee-San Tam, Senior Scientist, The Chinese University of Hong Kong

Scientific partners:

Dr. Alaster Hang-Yung Lau, Professor, The Chinese University of Hong Kong

Dr. Joseph W.O. Tam, CEO/Chairman of Board, DiagCor Bioscience (Hong Kong)

Scientific advisors and collaborators:

Dr. Tak-Hong Lee, Director of Allergy Centre, Hong Kong Sanatorium and Hospital

Dr. Didier Scherrer, Vice President of R&D, ABIVAX, France

Dr. Robert H. Roth, Professor of Psychiatry and Pharmacology, Yale University School of Medicine

Competition and Niche

- A)** 肥大细胞是过敏反应的主要效应细胞。目前,我们是世界上唯一一家提供初级培养的人肥大细胞作为发展诊断试验和药物筛选服务的科学平台,用于人类过敏性疾病的商业公司。

- B)** 许多学术实验室提供 "嗜碱性细胞活化试验" 作为过敏试验。然而,由于嗜碱性细胞不是直接效应细胞的过敏,这样的测试是间接评估。由于技术问题,这种测试也不太准确。

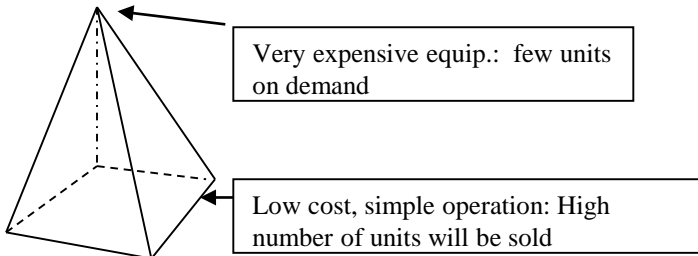
Pipeline Products

- A) 血基肥大细胞活化过敏试验确定/预测正常人健康个体对重症药物过敏反应的敏感性 (执行阶段: 诊断和个性化预防]
- B) 那些易受严重过敏反应或严重过敏反应的人的表观生物标志物/特征
- C) 基因组生物标记是特定于中国的华人群体, 他们极易受到或正在遭受 (1) 严重的免疫学过敏反应 (2) 严重药物引起的过敏反应

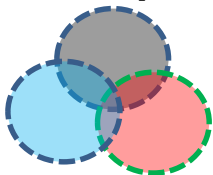
Biotechnology in Hong Kong

1997

- ◆ 1) Projects: Income from Day ONE or with (>50%) success
- ◆ 2) Must have *Niche* Market and has (or develop) its own IP
- ◆ 3) A relatively large market – appeal to general public



- ◆ 4) Synergism for efficiency development: **Collaborations**



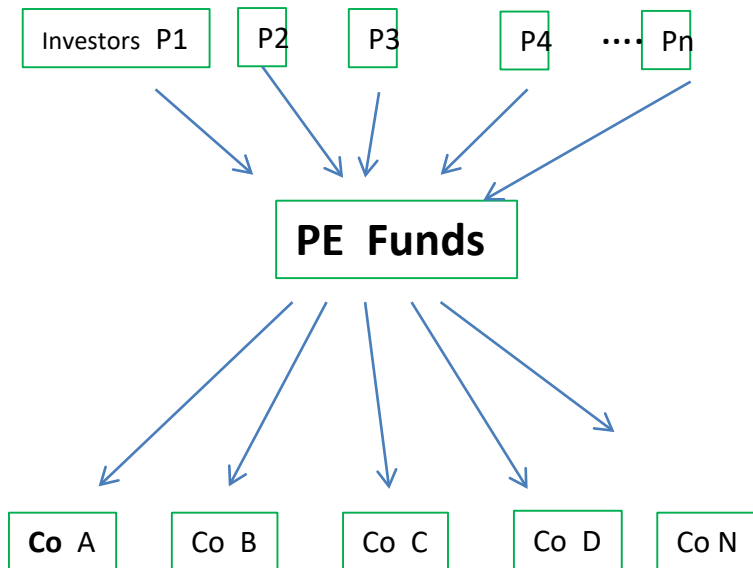
2018

- Smell the Technology in the Air ?
- Funding Available for startups?
- How to capture Chapter 18A ?

Increase the Success Rate:
How to reduce the Risk

Biotechnology in Hong Kong

- General



- Proposed:

