

- Start a Fresh Chapter of Healthy Life !
- Leading Supplier of Green Healthy Material !

益曜科技有限公司 Ecolar Technology Limited



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About Us



About Us

- ❑ Ecolar Technology Limited, is a **scientific innovation enterprise** in Hong Kong, jointly incubated by “Hong Kong Polytechnic University and Hong Kong Science and Technology Park”, dedicating to develop **green and safe antimicrobial materials**, and adhering to the corporate values of “**integrity service, continuous innovation, win-win cooperation**”.

The company's core R&D team and service platforms:

- Smart Wearable System Research Institute (The Hong Kong Polytechnic University, Hong Kong)
- School of Fashion and Textiles (The Hong Kong Polytechnic University, Hong Kong)
- The Hong Kong Polytechnic University-Jinjiang Technology Innovation Institute (Fujian of China)
- Yinhu Innovation and Entrepreneurship Research Institute, Zhejiang University of Technology, China



Incubated by Hong Kong Polytechnic University and the Hong Kong Science and Technology Park



Protecting environment and human health



Credibility, continuous innovation, win-win cooperation





Background & Brand



Background



- ◆ **Drug-resistant bacteria** and bacterial infection
- ◆ Rage of COVID-19, H1N1, H3N2 and other **coronavirus**



- ◆ **Environmental pollution** of antimicrobial materials, e.g. heavy metal and toxic chemicals.



- ◆ **Biotoxicity** of current antimicrobial materials



Brand

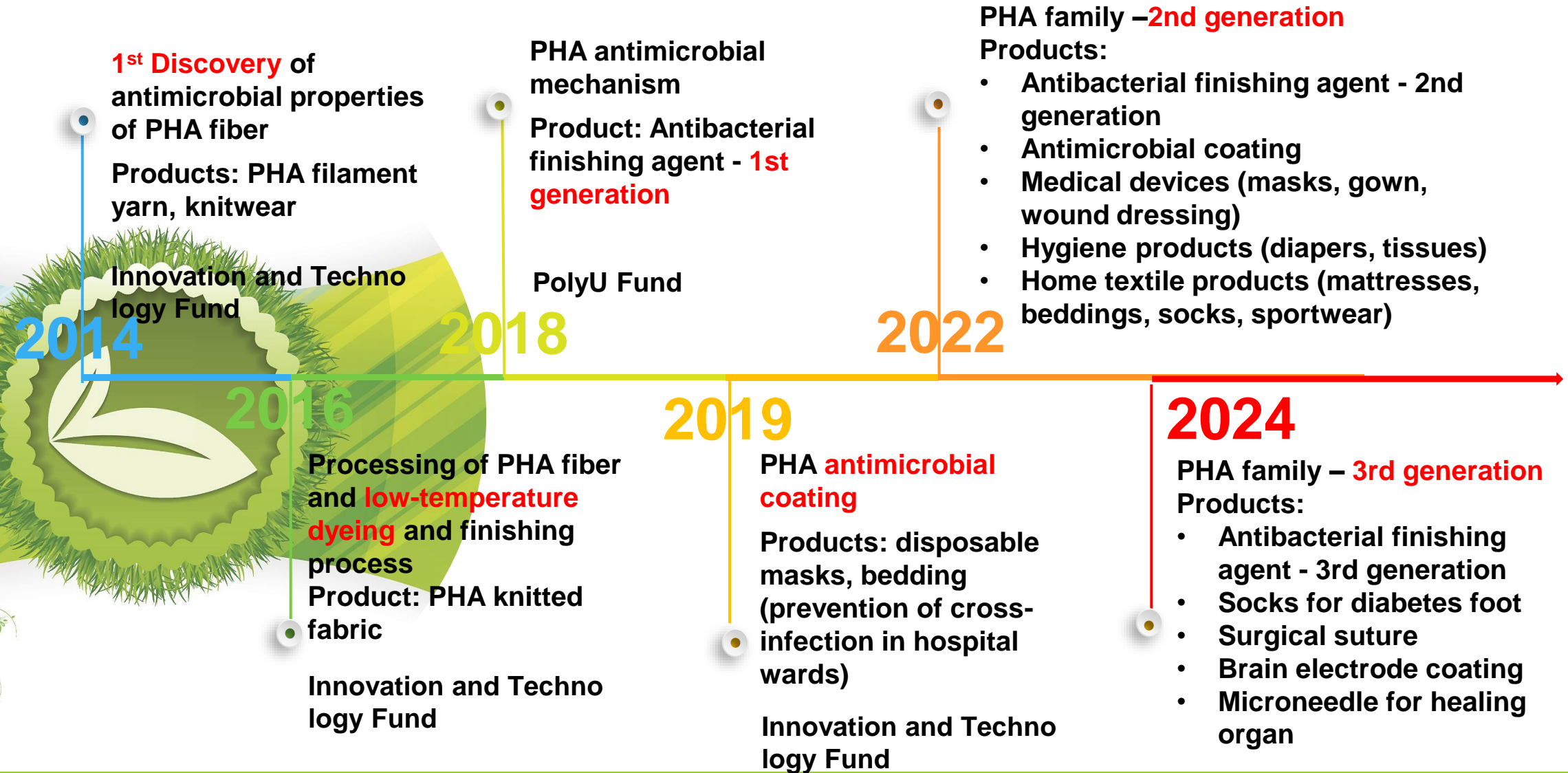


- ◆ In this background, we created the "**BLESSTAR®**" and "**EVER ECOLAR®**" series of **eco-friendly biodegradable antibacterial and antiviral** products.
- ◆ Main products and services: **high-efficiency** antibacterial and antiviral **finishing agent**, disinfectant, textiles and related technical services.
- ◆ Widely used in **medical supplies, textile and apparel**, home textiles, maternal and child care, personal protection, sportswear etc.



History of PHA Materials

Product Upgrade with Technological Innovation



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Product Series of Green PHA Materials



Cross-border Integration and Market Expansion

01

Expansion in Medical & Nursing Fields

02

Convergence in Furniture and Building Materials

03

Innovation in Textile & Footwear and Clothing

04

Application in Infant & Hygiene Fields

05

Exploration in the Pet Field

01 Medical & Nursing Fields

Medical & Nursing Series 医疗护理系列:



Medical Dressings and Towels
医用敷料及辅巾



Antimicrobial Mask
抗菌抗病毒口罩



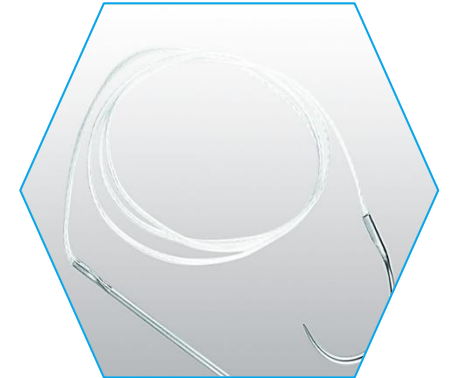
Antimicrobial Beddings
抗菌抗病毒三件套



Antimicrobial Nurse Gown
抗菌抗病毒护士服



Antimicrobial Sprays
抗菌抗病毒喷雾



Surgical Sutures
手术缝合线

Such as antibacterial and antiviral masks, nurse uniforms, dressings, sutures, bedding, sprays, etc., to improve the safety level of the medical environment.



02 Convergence in Furniture and Building Materials

Home Series 家具系列:

Antimicrobial
Mattress
抗菌抗病毒床垫



Antimicrobial
Furniture
抗菌抗病毒家具



Such as antibacterial and antiviral coatings, furniture, wallpaper, flooring, etc., to improve the health level of the home environment.

03 Innovation in Textile & Footwear and Clothing

Textile & Footwear and Clothing Series 纺织、鞋服系列:

Combine green antibacterial and antiviral materials with other functional materials to produce fabrics, socks, clothing, uppers and other products with protection, breathability, comfort and other functions, suitable for special environments or industries.



04 Application in Infant & Hygiene Fields

Infant & Hygiene Series 婴幼儿卫生系列:



Antimicrobial
Dry & Wet
Wipes
抗菌干巾&湿巾



Antimicrobial
Sprays
抗菌喷雾



Antimicrobial
Diapers
抗菌尿片



Antimicrobial
Liquid Detergen
for Baby
婴幼儿洗衣液

Such as antibacterial and antiviral wipes and dry wipes, diapers, baby washing liquid, etc., to improve the protection level of low immunity groups.



05 Exploration in the Pet Field

Pet Series
宠物系列:



Antimicrobial Fabrics, Clothing, mattress
and Sprays for Pets

宠物垫抗菌抗病毒面料、服饰垫子及喷雾

Such as antibacterial and deodorant spray, antibacterial and antiviral pet pads, pet clothes, etc., to improve the hygiene level of the pet living environment.



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Technical Characterization of Green PHA Materials

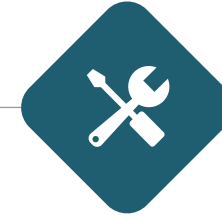


Performance Characterization and Evaluation



Microbial Culture Method

By culturing viruses and bacteria, the effects of green antibacterial and antiviral materials on microbial growth were observed.



Molecular Biology Methods

Molecular biology techniques were used to detect the effects of green antibacterial and antiviral materials on viral and bacterial genetic material.



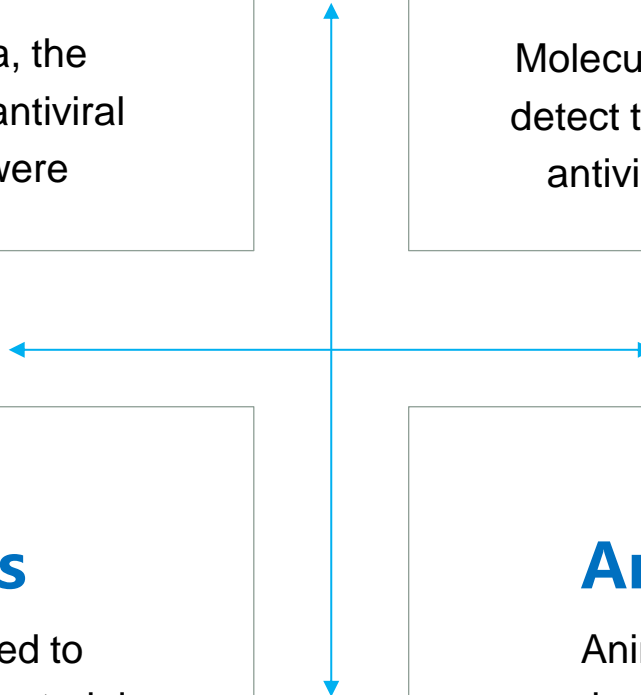
Cell Experiments

Cell experiments were conducted to observe the effects of green antibacterial and antiviral materials on cell growth and metabolism.



Animal Experiments

Animal experiments were conducted to evaluate the in vivo antibacterial and antiviral effects and biosafety of green antibacterial and antiviral materials.





Safe and Environmental Assessment



Safe Assessment

Green antibacterial and antiviral materials have undergone strict third-party safety verification, including tests for toxicity, skin irritation, sensitization, etc., to ensure that they are harmless to humans.

- ❑ Fully biodegradable, low carbon emission
- ❑ Broad-spectrum antiviral/antimicrobial property.
- ❑ Non-toxic and non-allergenic.
- ❑ Simple preparation and cost-effectiveness.
- ❑ Stable and durable.



Environmental Assessment

In the process of production and use, the green antibacterial and antiviral materials meet the requirements of environmental protection, are completely biodegradable, have low carbon emissions, and do not cause any pollution and damage to the environment.



Product Technical Features



Antibacterial Performance (ASTM E2315-16 + ASTM E2783-22)

Concentration	S. Aureus (1min)	K. Pneumoniae (1min)	C. Albicans (1min)	Methicillin-resistant S. Aureus (1h)
20 mg/mL	> 99.99%	> 99.99%	> 99.99%	> 99.99%

Antiviral Performance of (20 mg/mL (2002 Ministry of Health, China, ISO 18184-2019)

Index/Virus	COVID-19 (20min)	H1N1 (1min)	H1N1 (1h)	H3N2 (1min)	H3N2 (1h)
Inactivation rate	> 99.99%	> 99.9%	> 99.99%	> 99.9%	> 99.99%
Inactivation index	> 4	> 3	> 4	> 3	> 4

Skin irritation of (ISO 10993-10: 2010, 100mg/mL)

Index/Position	Oral mucosa of hamster	Vagina of white rabbit
Irritation index	0.7	0.7
Irritation reaction	negligible	negligible



BUREAU
VERITAS

SGS



广东省微生物分析检测中心
Guangdong Detection Center of Microbiology



Competitive Analysis

Items	Inorganic	Organic	Natural	EVER ECOLAR
Typical products	Ag, CU, Mg and Zn compounds or nanoparticles	quaternary ammonium, Polybiguanides,	chitosan	PHA or its water solution
Antiviral/antimicrobial	excellent	excellent	good	excellent
Toxicity and allergy	high	medium	no	no
Lethal Dose50 (mg/kg)	2000	25.6	1500	4300
Degradation product	residuals of Ag, Cu, Zn	residuals of S, Cl, and N	H ₂ O, CO ₂ , N or others	Only H ₂ O, CO ₂
Emission of CO ₂ (kg CO ₂ eq/kg)	2.91 (ZnO)	1.08 (Cl ₂)	2.11(NH ₃)	0.5
Price as disinfectant	> \$1000/L Nano-silver solution	\$200/kg	> \$480/kg	\$40~150/Kg
Price as finishing agent	> \$1000/L Nano-silver solution	\$180/kg	> \$300/kg	\$40~150/Kg



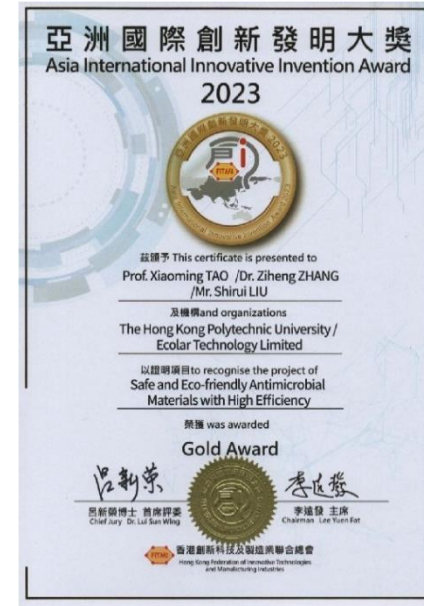
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Social/Community Impact



Awards

- ❑ **2024 The 1st Jinjiang Trade Fair on Scientific & Technological Innovation- 10 Achievements**
- ❑ **2023 Geneva International Exhibition of Inventions - Gold Medal**
- ❑ **2023 FITMI - Asia International Innovative Invention Award - Gold Award**
- ❑ **2023 Hong Kong 5th Hong Kong Innovation Day - third place**
- ❑ **2023 Hang Seng x PolyU Sustainable Future Challenge: Textile & Fashion - 1st Runner Up**
- ❑ **2020 Hong Kong Environmental Excellence Awards Excellence Award**
- ❑ **2018 R&D 100 Awards - Special Recognition Award (Green Tech) - Bronze Award**
- ❑ **2016 Hong Kong Green Innovations Awards - Silver Award**





News and Activities



益曜科技：改善科研轉化制度

由理大及科技園共同孵化的益曜科技，開發一系列基於聚羧基脂肪酸酯 (PHA) 的綠色安全抗菌材料，可應用於醫療衛生領域。益曜科技首席執行官張子恆 (見圖) 指，參與海外論壇，讓公司可展示先進技術和產品，同時學習歐洲前沿研究及轉化科技成果制度。

張子恆認為，畢竟在科技轉化過程中，需要場地、人員及工業基礎設施配套，需要香港與粵港澳大灣區城市，以及世界其他國家開展更多合作，同時完善改進科研轉化制度，從而可讓先進科技更加高效的落地轉化。



2023 Hong Kong Entrepreneur Delegation to Europe (Ta Kung Pao)



Interview with CCTV's "Road of Ingenuity" column



Connections with Jinjiang industry (Jinjiang economy news)



2023 Sustainable Future Challenge (1st runner-up) (Hong Kong Economic Journal)



InvestHK-Hunan S&T conference (Hong Kong Economic Herald)



2024 Biotech International Convention in San Diego



Business Development

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THANKS
感谢观看!

