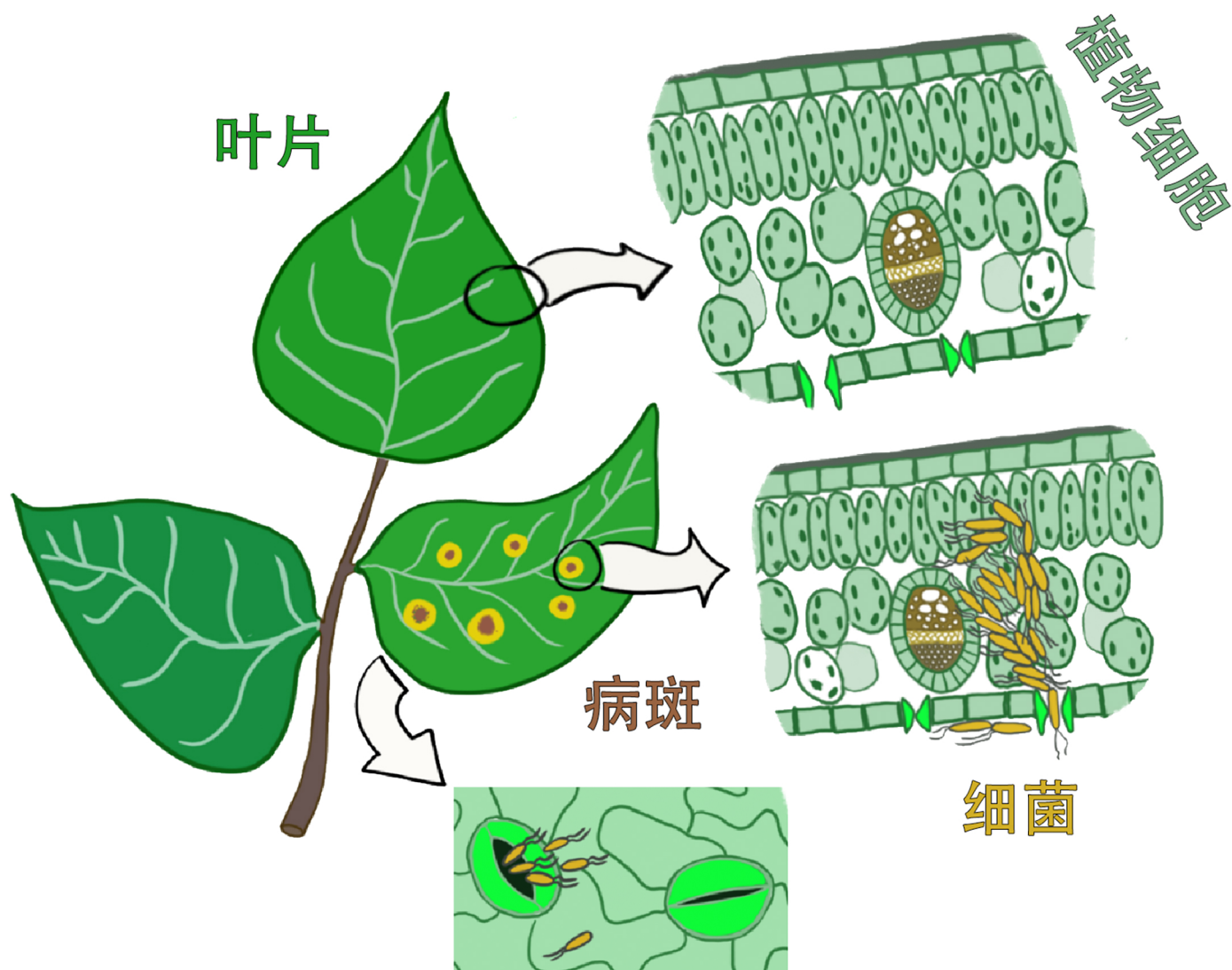


StomaToy

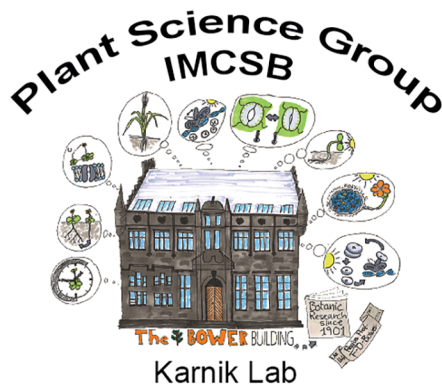
活动手册

成为小小植物学家，探索植物疾病的奥秘



气孔-植物的保卫者！

THE ROYAL SOCIETY

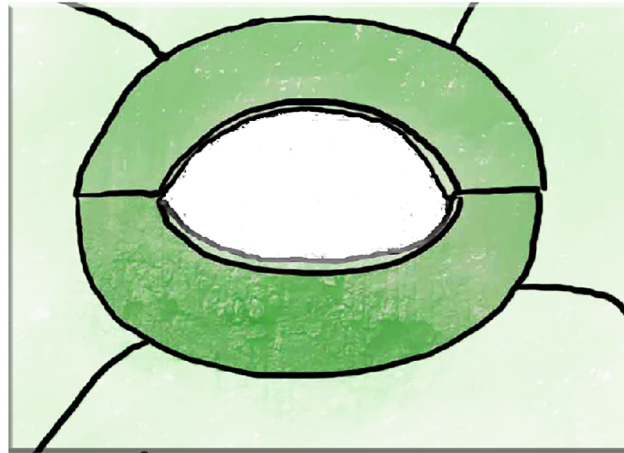


University of Glasgow

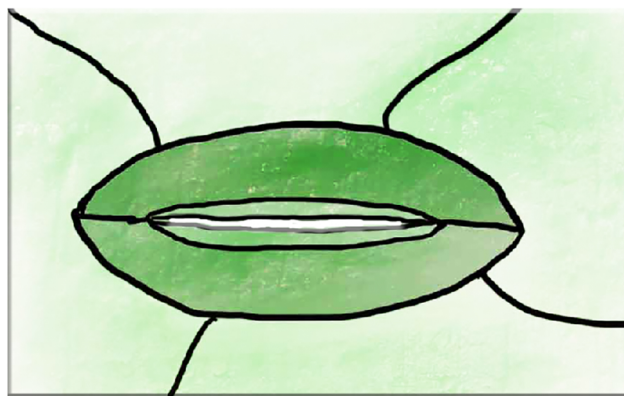
每个气孔由两个保卫细胞和中央的小孔组成

保卫细胞就像气球一样!!!

保卫细胞膨胀，气孔张开



保卫细胞失水，体积缩小，气孔关闭



Upload photos of your StomaToy activities
@Stomatal_2019

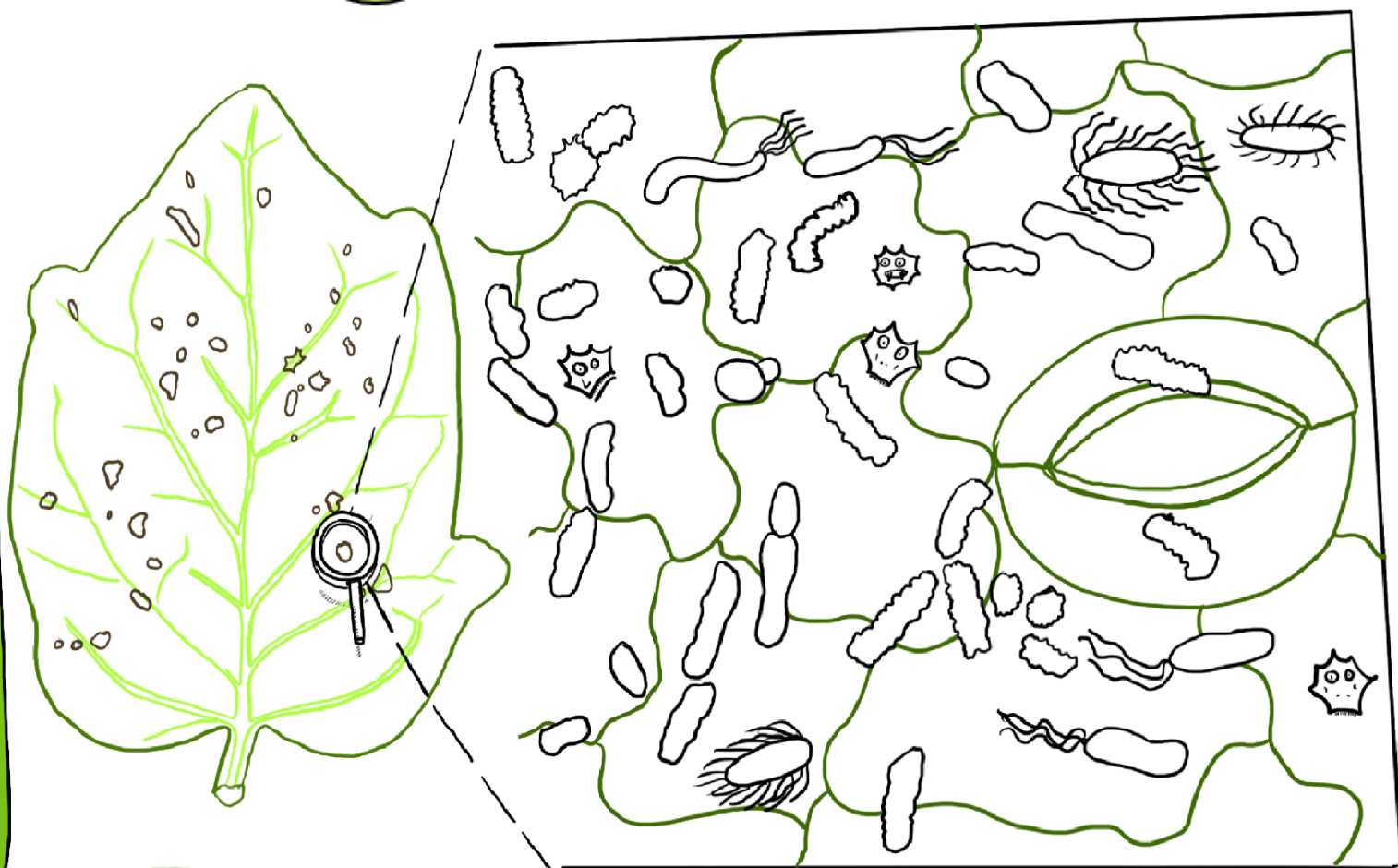


Leaf & Bacteria

你能在下图中找到气孔和病菌吗？

将气孔涂为绿色！

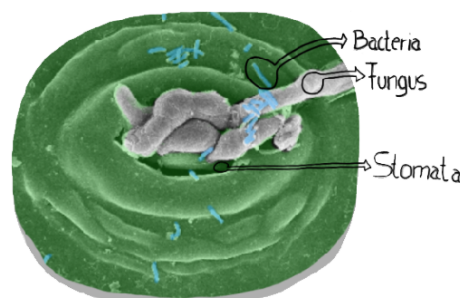
将病菌涂为橙色！



扫描电子显微镜照片：病原菌侵染植物叶片



模式植物拟南芥叶片受到病原菌 *Pseudomonas syringae* (DC3000) 侵染。



Scanning electron micrograph: M. Hain

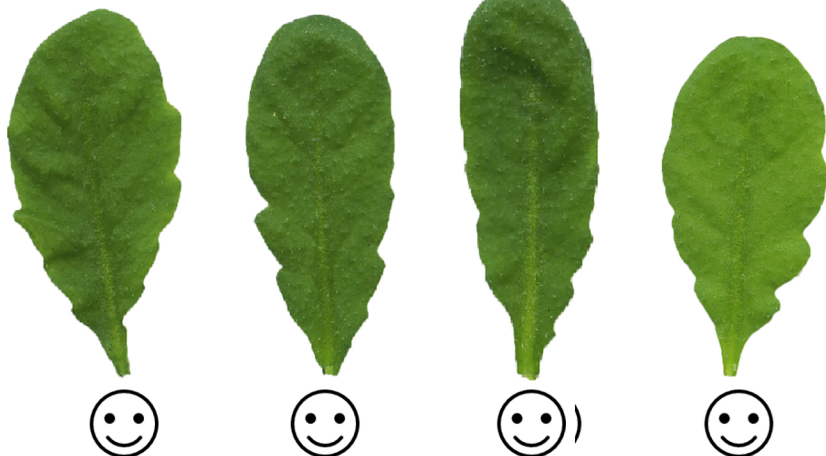


成为小小植物科学家!

从下面的实验开始!

Leaf + water

1 2 3 4



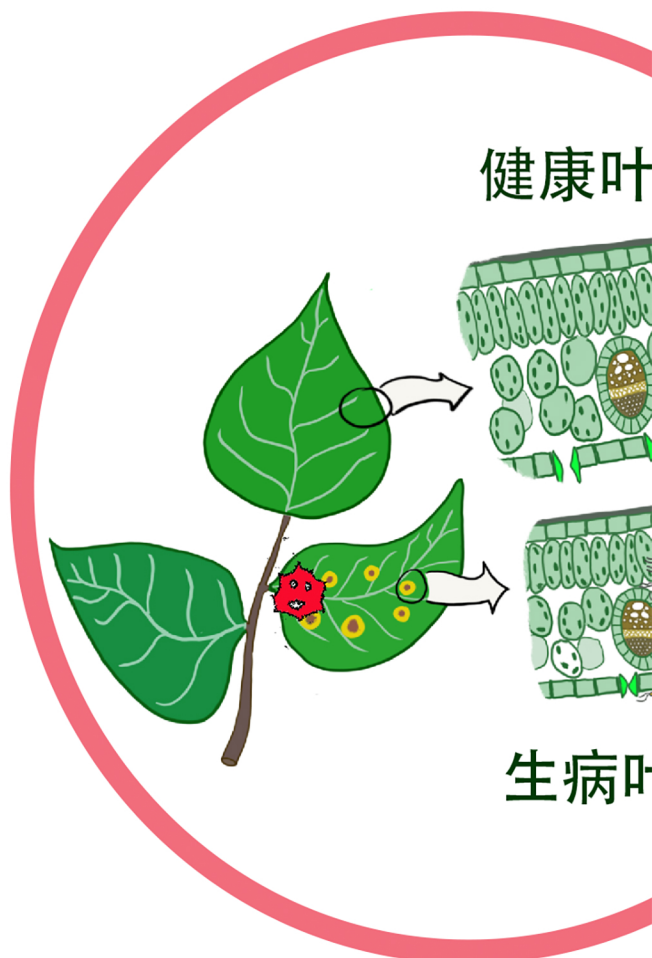
叶片加水

Leaf + Bacteria



叶片加病菌

病菌会使植物生病!
被病菌侵入的叶片会萎蔫发黄。



健康叶

生病叶

你能找到被病菌侵入的叶片吗？数数有多少！

植物#1



叶片总数 ☺☹

生病叶片数 ☹

植物#2



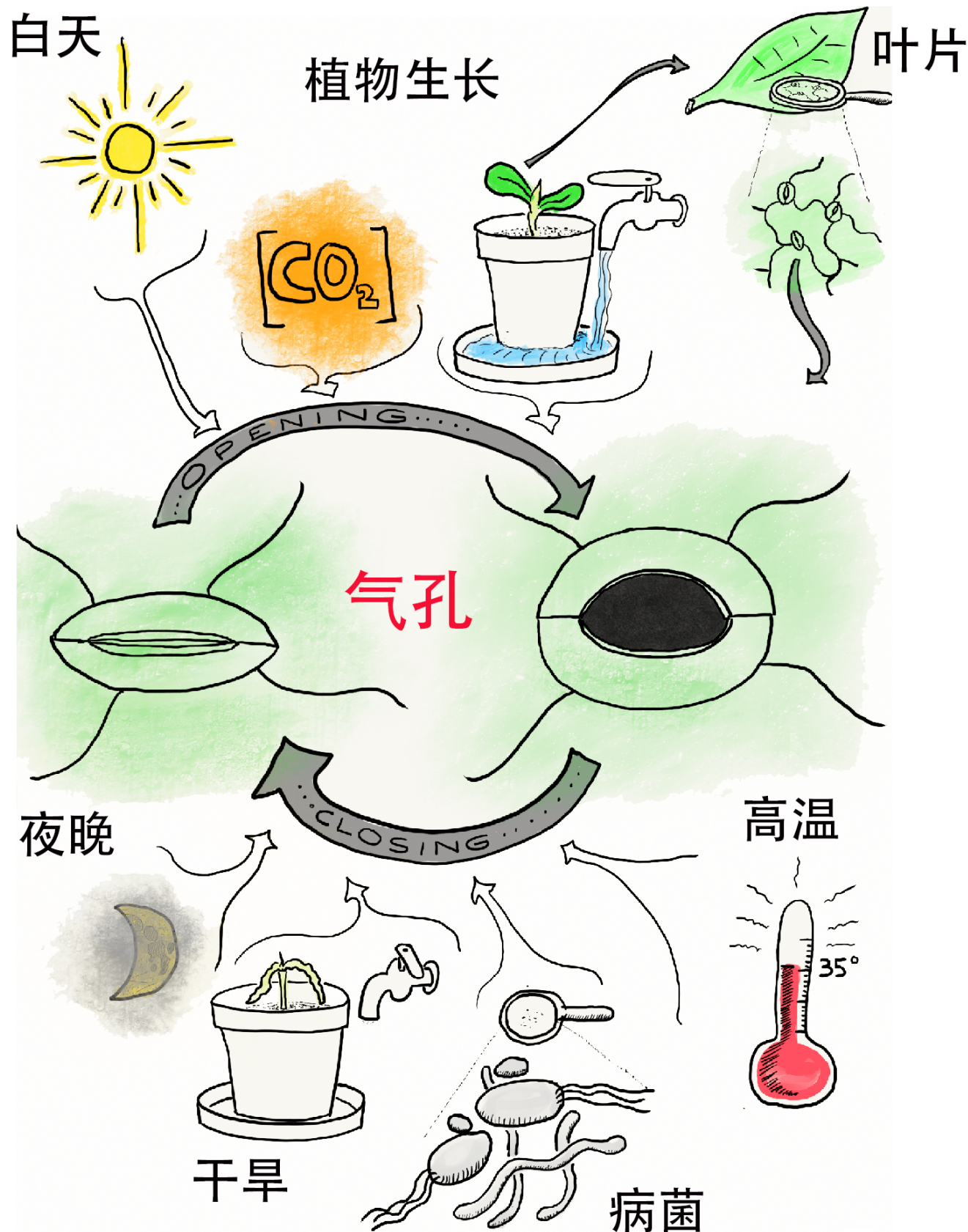
叶片总数 ☺☹

生病叶片数 ☹

片

片

气孔是叶片上的小开孔!



植物通过气孔开闭，控制了物质可以进出叶片。

画一棵属于你的植物



StomaToy is designed and constructed by

R. Karnik Lab



Plant Science Group, IMCSB, University of Glasgow

Dr. Abe Karnik

Interactive Systems Group, SCC, Lancaster University

Lancaster
University



StomaToy Activity book concepts & design by

Dr. Rucha Karnik, Plant Scientist

Dr. Mathis Riehle, Cell Engineer & Artist

Art by **Dr. Mathis Riehle**

StomaToy Project co-ordinator **Ms Claire Osborne**

Admin. & Public engagement co-ordinator, IMCSB



Plant images by Lingfeng, Harry & Matthew (students, Karnik lab)

SEM Images by Margaret Mullin

Stomatoy Video edited by Lingfeng Xia & Flora Leask

中文翻译: 张犇 (山西大学)

@Stomatal_2019



Interactive StomaToy & Video are funded by

Royal Society Public Engagement Award to Rucha Karnik



THE ROYAL
SOCIETY

StomaToy Activity book & Paper StomaToy Cube are funded by

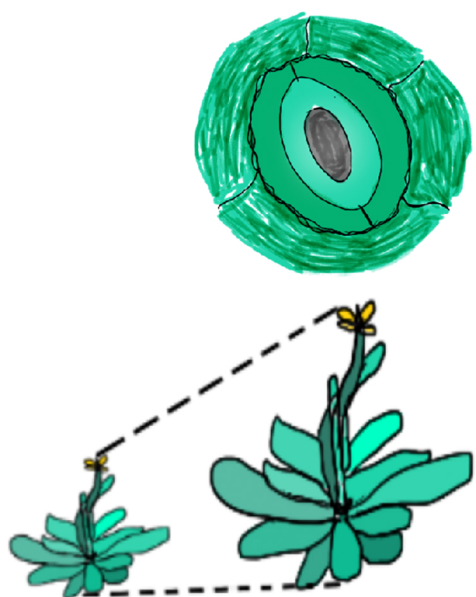
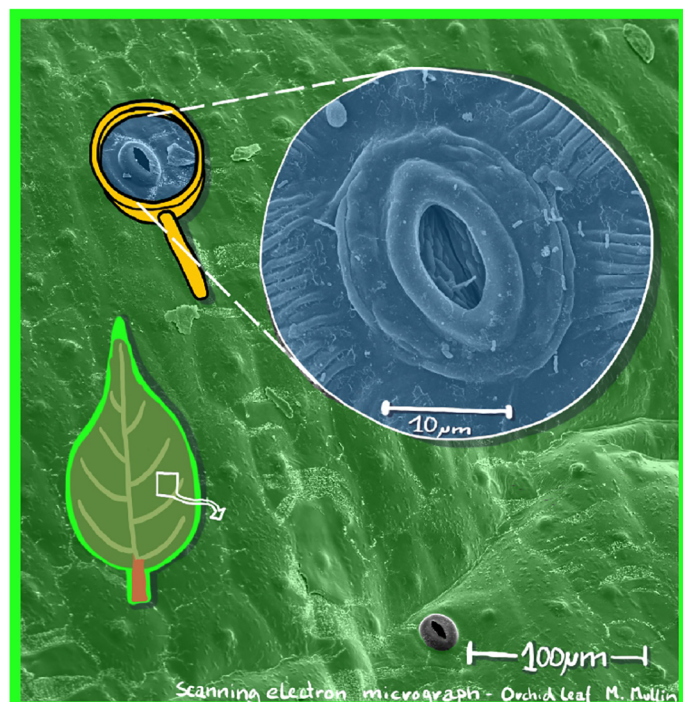
MVLS Engagement Award to Rucha Karnik



University
of Glasgow

气孔-植物的保卫者

气孔是叶片上的小孔，在关闭时可以避免病菌进入叶片。



在植物生长过程中，气孔开放，允许气体交换，供给光合作用使用。同时气孔开放会使植物失水。

病菌侵入也会使植物生病。植物学家研究病原微生物与植物的关系，以了解植物疾病和免疫的知识。这些知识将帮助我们获得抗病农作物。

