



We
Robotics
Global

Patrick Meier & Adam Klaptocz

WeRobotics

Transforming Transportation

@WeRobotics



DEATHS PER YEAR

Mosquito	725,000
Freshwater snail	110,000
Ascaris roundworm	60,000
Venomous snake	50,000
Rabid dog	40,000
Assassin bug	12,000
Tsetse fly	9,000
Tapeworm	2,000
Crocodile	1,000
Hippo	500
Elephant	100
Lion	100
Wolf	10
Shark	10





A *Wolbachia* Symbiont in *Aedes aegypti* Limits Infection with Dengue, Chikungunya, and *Plasmodium*

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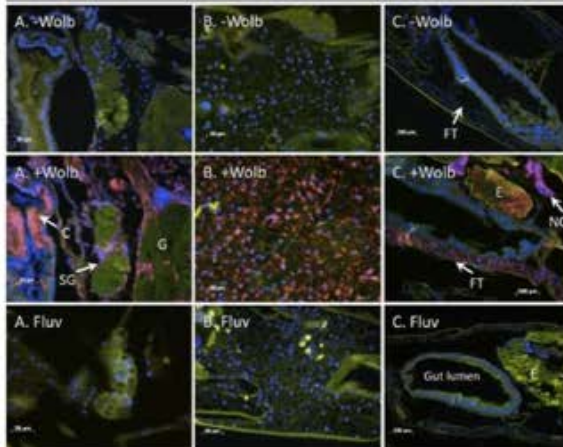
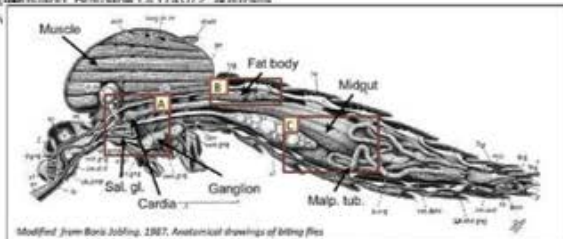
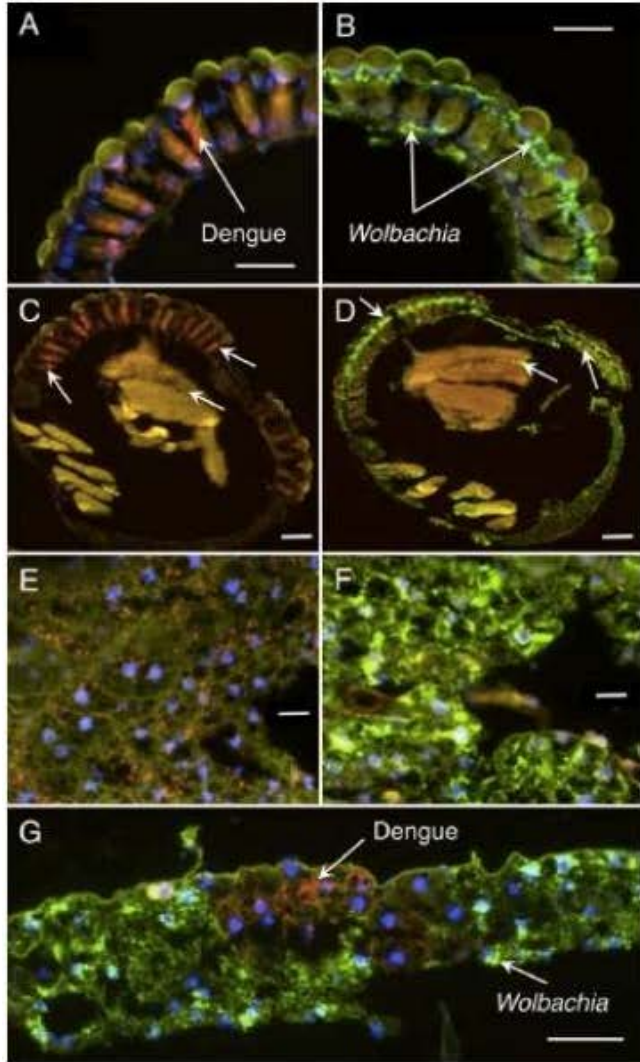
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ELSEVIER

Back to the future: the sterile insect technique against mosquito disease vectors

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With the global burden of mosquito-borne diseases increasing, and some conventional vector control tools losing effectiveness, the sterile insect technique (SIT) is a potential new tool in the arsenal. Equipment and protocols have been developed and validated for efficient mass-rearing, irradiation and release of *Aedines* and *Anophelines* that could be useful for several control approaches. Assessment of male quality is becoming more sophisticated, and several groups are well advanced in pilot site selection and population surveillance. It will not be long before SIT feasibility has been evaluated in various settings. Until perfect sexing mechanisms exist, combination of *Wolbachia*-induced phenotypes, such as cytoplasmic incompatibility and pathogen interference, and irradiation may prove to be the safest solution for population suppression.

Address

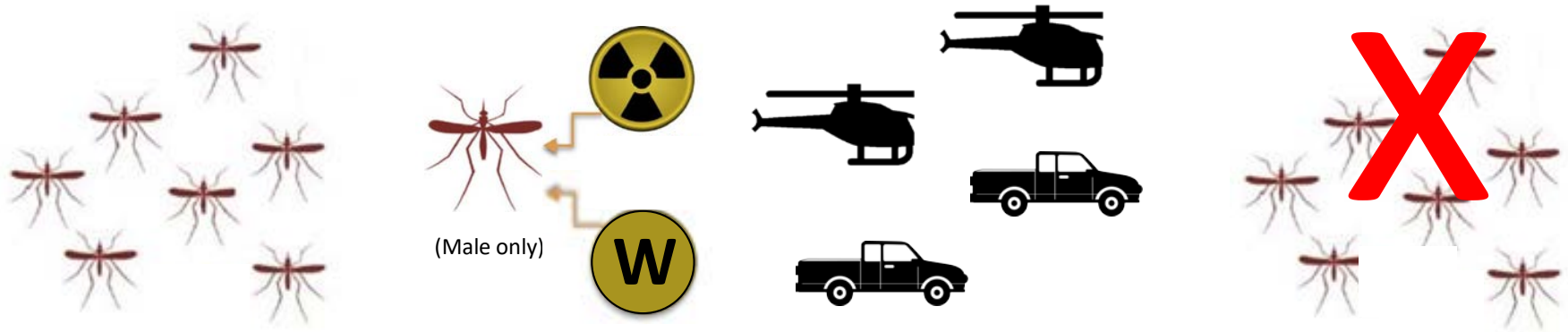
Insect Pest Control Sub-programme, Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, Vienna, Austria

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reliefweb.int/files/resources/Multisectoral-Framework-for-Malaria.pdf).

The pressure placed on humanity by these vectors is increasing. Expansion of the distribution of several *Aedes* species such as *Aedes albopictus* [1] is evident in many areas, including Europe [2,3] and USA [4]. Laboratory and field experiments have predicted that *A. albopictus* has the potential to invade large areas of Africa [5] and urbanisation is increasing its abundance in Europe [6]. With no effective vaccines or specific drugs to prevent or treat mosquito-borne diseases, the best line of defence is to combat the vector, to remove the contact between mosquitoes and humans and thus interrupt the transmission cycle. Effective mosquito control has been hampered by growing insecticide resistance of major malaria and dengue vectors [8], even in regions only recently invaded (e.g. [9]). There is therefore increasing interest for complementary tactics that are effective, sustainable and friendly to the environment.

Reducing disease vectors by reducing mosquitoes population



Insect rearing → Treatment → Release → Population suppression

90% drop in mosquito
population

- USAID Workshop, July 2016













Joint FAO/IAEA Programme
Nuclear Techniques in Food and Agriculture







DJI Matrice M600 Pro

Onboard flightcontroller

Transmission to ground control

Interface to release mechanism

Release mechanism

Interface to drone

Mosquito release control

Ground control app

Mission planning

Release mechanism settings

Remote control

Safety control in hazardous situations

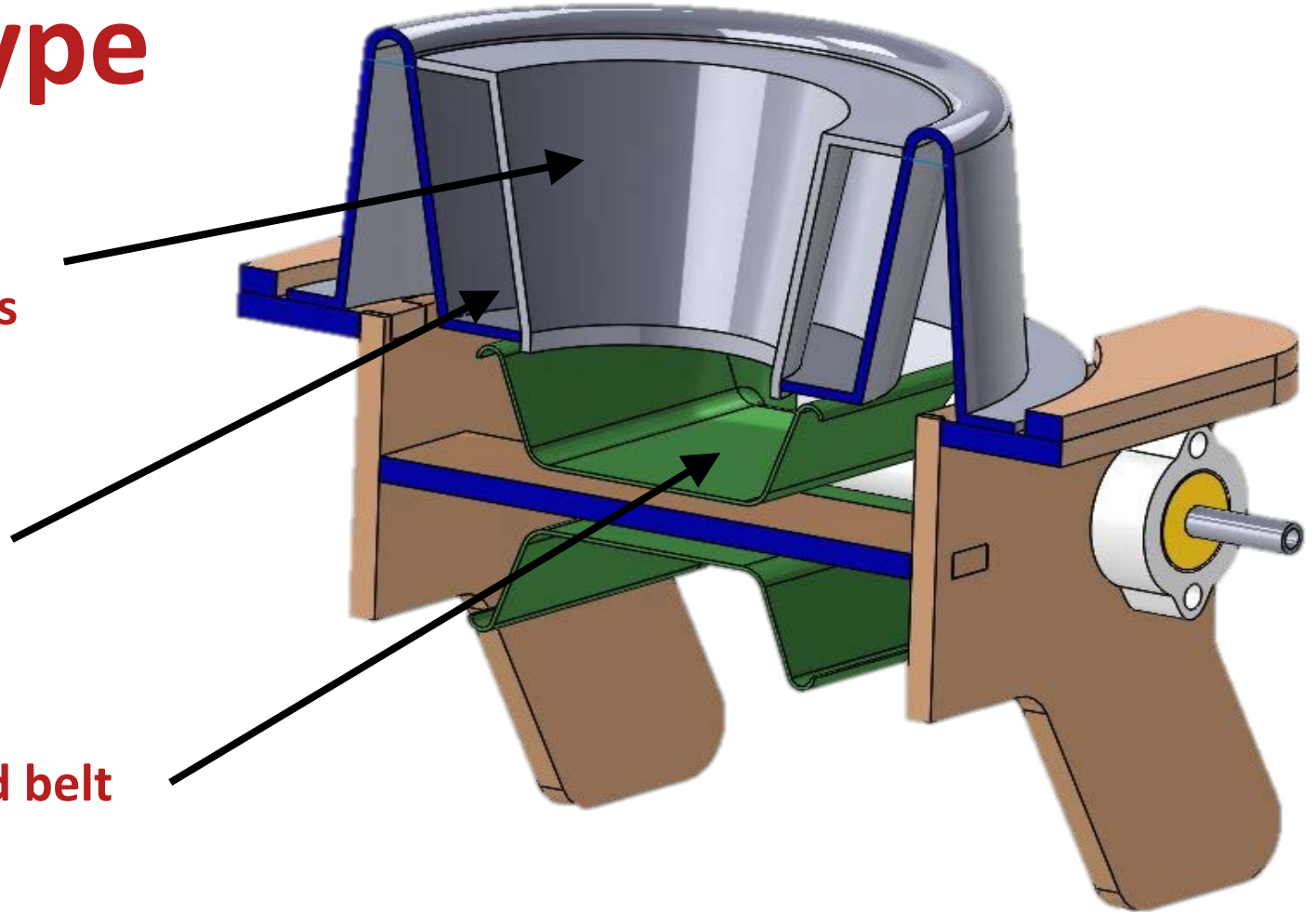


Prototype

Container filled
with mosquitoes

PCM (cooling)

Actuated curved belt



LONDON
SCHOOL of
HYGIENE
& TROPICAL
MEDICINE



Bug Bites

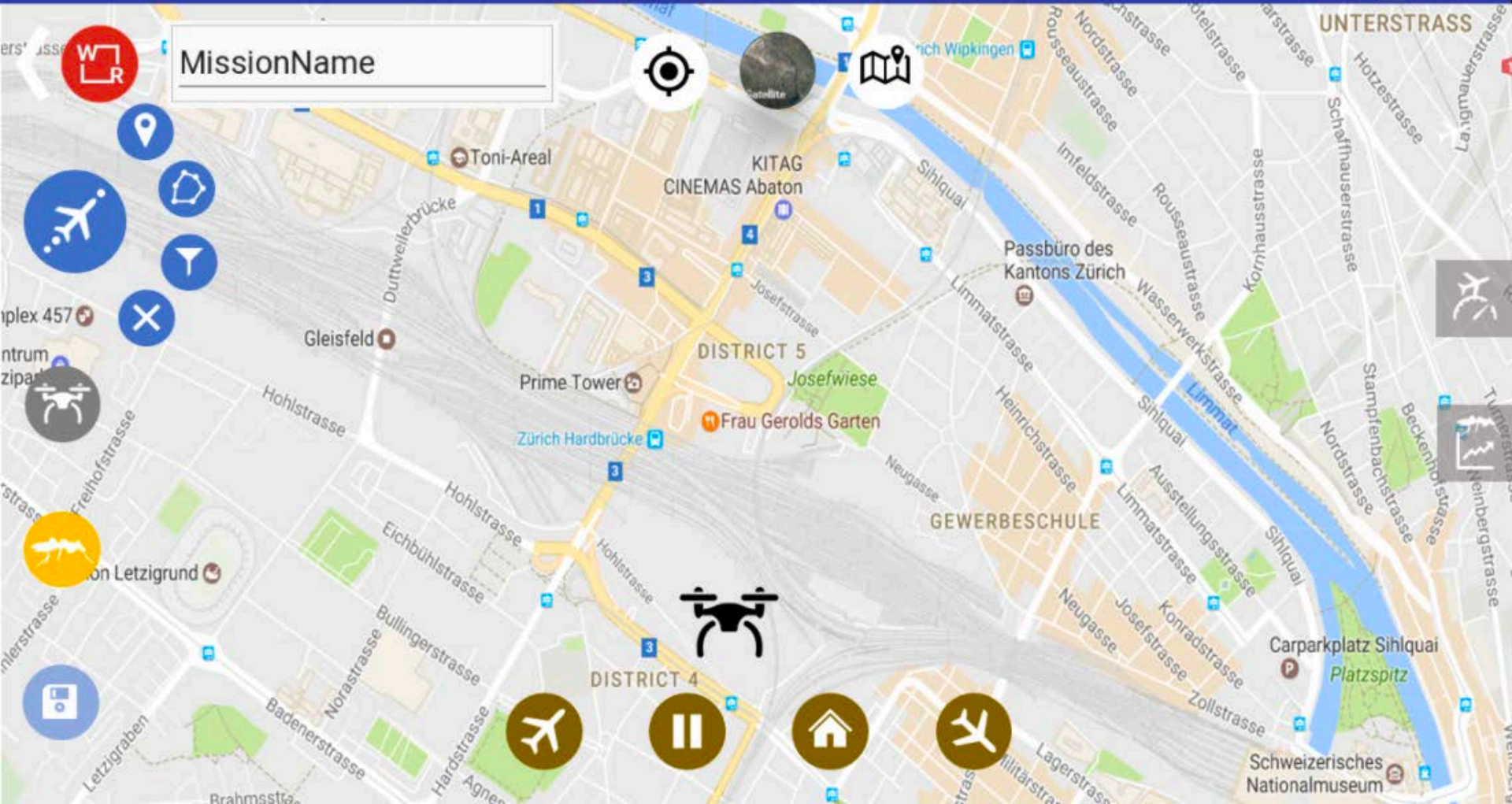
Bug Shaped Jelly Sweets





MissionName

- WR (Red square icon)
- Location pin (Blue circle icon)
- Home (Blue circle icon)
- Drone (Blue circle icon)
- Target (Blue circle icon)
- Close (Blue circle icon)
- Drone (Grey circle icon)
- Antenna (Yellow circle icon)
- Drone (Blue circle icon)
- Home (Blue circle icon)
- Drone (Blue circle icon)





Makers' Manifesto

1. We are excellent to each other.
2. We keep things sorted.
3. We keep things functioning.
4. We keep things clean.
5. We make things shine.
6. We sustain and keep those values.





Mechanism prototype

Drone integration`

Semi-field tests Vienna

Field tests Peru

Jun 17

Jul 17

Aug 17

Dec 17

ELIMINATE
DENGUE
OUR CHALLENGE





Peru
FlyingLabs

