

Novel molecules that repel and kill dengue causing mosquito (*Aedes aegypti*)

EXECUTIVE SUMMARY

CSIR-NCL has developed novel and patented molecules that repel and kill mature female *Aedes aegypti* (dengue causing mosquito). The molecules show excellent repellence activity (> 06 hrs-calculated as protection time) for lower dose (0.25 mg/cm²). The molecules also show rapid killing action (100 % mortality within 5 to 10 mins). Molecules are safe in acute dermal toxicity tests. It is available for licensing to formulators of anti-mosquito products.

BACKGROUND

- According to WHO, there are an estimated 390 million infections each year¹
- Dengue is a viral infection that is spread by the bite of a mature female *Aedes aegypti* mosquito
- An important strategy for prevention of dengue is the use of repellents and mosquitocidal formulations especially acting on *Aedes aegypti*.
- Mosquitos are increasingly showing resistance to commonly used repellents molecules such as DEET (N, N-Diethyl-3-methylbenzamide), pyrethrins, metofluthrin etc.
- Thus, novel and safe molecules which repel and kill *Aedes aegypti* is a pressing need

TECHNOLOGY DESCRIPTION

- CSIR-NCL scientists have synthesized novel molecules (NDS-100598) based on noreremophilane and nardoaristolone B scaffold which indicated excellent activity against adult females of *Aedes aegypti*
- ✓ **Repellence activity:** (> 06 hrs---assessed on the basis of the protection period)
 - ✓ **Killing rate & time:** 100 % within 5-10 mins
 - ✓ **On set of action:** Immediate
 - ✓ **Acute dermal toxicity:** Safe

- Technology includes a family of molecules and process of preparation

MARKET POTENTIAL

- Mosquito repellent market is expected to reach \$4.8 billion by 2022 with 7.7 % CAGR²
- India mosquito repellent market stood at \$ 670 million in 2018 and is projected to grow to nearly \$ 900 million by 2024³

VALUE PROPOSITION

- Novel, safe and highly effective mosquitocidal mosquito-repellent molecules for inclusion in formulations aimed at dengue protection market
- Patent protected molecules with protection in IN, US

APPLICATIONS

- Topical mosquito repellent formulations in the form of liquids, lotions, cream, spray etc.

TECHNOLOGY STATUS

- Technology available for licensing/co-development
- Patent granted: [US9950983](#)
- Patent Pending: IN2082/DEL/2014, 1143/DEL/2013, WO2014/170915

REFERENCES

1. <https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue>
 2. <https://www.alliedmarketresearch.com/mosquito-repellent-market>
 3. <https://www.techsciresearch.com/report/india-mosquito-repellent-market/3847.html>
- News: <https://www.biotechnika.org/2019/04/ncl-pune-scientists-discover-mosquito-repelling-molecule/>