🧬 IIT-Madras Develops Portable Genetic Testing Device

📍 Location

Chennai, Tamil Nadu

📰 Key Highlights

- **IIT-Madras researchers have designed a low-cost, portable genetic testing device capable of detecting disease-causing mutations in under an hour.**
- **The device combines microfluidic lab-on-chip technology with AI-powered algorithms to ensure speed, accuracy, and affordability.**
- **Applications include early detection of inherited disorders, cancer-related mutations, and infectious diseases.**

🔬 How It Works

- **The system uses a microfluidic cartridge, where a small blood or saliva sample is placed.**
- **Onboard AI analyzes DNA fragments and flags abnormal gene patterns.**
- **The process eliminates the need for complex laboratory infrastructure.**

💡 Significance

- **Genetic testing in India is often expensive (₹15,000–₹50,000 per test) and available mainly in urban centers.**
- **This device is projected to cost less than ₹1,000 per test, making genomic diagnostics accessible in rural and tier-2/3 cities.**
- **Enables rapid, point-of-care testing, useful in emergency and preventive healthcare settings.**

🏥 Potential Impact

- **Can be deployed in primary health centers (PHCs) for newborn screening and rare disease detection.**
- **Supports personalized medicine approaches in oncology.**
- **Helps India bridge the diagnostic gap between urban and rural populations.**

👩‍🔬 Expert Quote

Dr. Raghunandan, lead researcher at IIT-Madras, said:

> **“Our goal was to make genetic testing as simple and accessible as a routine blood test. This device has the potential to transform community healthcare and preventive medicine in India.”**

⏭️ Next Steps

- **The prototype is undergoing clinical validation trials in collaboration with AIIMS Delhi and CMC Vellore.**
- **Commercial launch is expected within 18–24 months, pending regulatory approval.**
- **Start-up incubation is planned to scale manufacturing and distribution across India.**