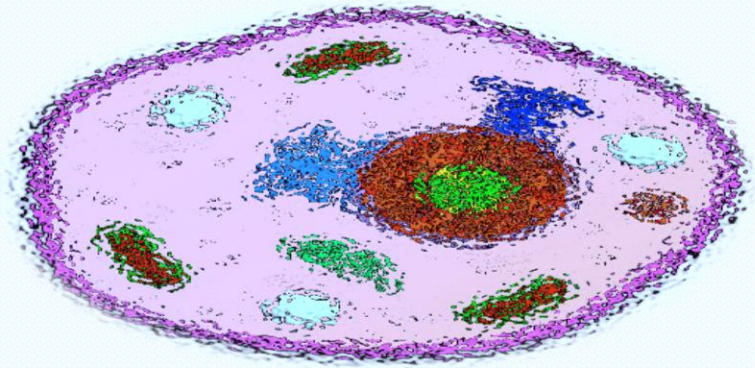
# *Living Condensed Matter Biosensor Technology*



***Next generation  healthcare & wellbeing machine***

# Executive summary

| | |
|---|---|
| **Company** | **R&D Intercell is a Research and Development company invented unique biosensor technology applicable to healthcare and wellbeing. Currently the company develops smart integrated wearable device meant for noninvasive real time blood glucose monitoring that is actionable in early prevention of diabetes.** |
| **Problem** | **The global challenge is – "no blood, no needle" real time continuous blood glucose monitor actionable in early prevention of diabetes and other chronic disease.** |
| **Solution** | **LCM Biosensor is a perfect product for both as treatment and diagnostics.** |
| **Current status** | **Clinical proof of concept study was conducted with group of 50 patients, 8 prototypes of microcalorimeter manufactured and tested to start clinical validation and trials.** |
| **Next steps** | **Company is raising $3M round to develop the consumer Life Style device by miniaturization of prototype and Clinical proof-of-concept study in US.** |

# The Global Challenge.

**Diabetes is one of the biggest global threats today.**


**For pre-diabetes, it is estimated that 88% of patients are unaware of their condition and it takes less than five years for it to progress to full fledged disease.**

**But Type 2 diabetes is a fully preventable disease. This is a good news, driving us toward some breakthrough technology that will allow to build some consumer device for self-diagnoses of this chronic disease.**

**At last but not least, one more global problem, related to diabetes challenge, is the invention of noninvasive glucose monitoring device for diabetes treatment to replace conventional finger - prick glucometers.**

# The Product

***Life style device for metabolic monitoring***: **smart integrated multi sensors device for noninvasive real time continuous blood sugar and income calories monitoring.**

***Unlike currently available consumer devices***, **such as Fitbit, Apple Watch and Biostrap, that only provide nonspecific information on physical activity and heart rate,** ***our noninvasive intercellular osmotic pressure monitor collects molecular level data that is actionable in early prevention of diabetes and other chronic disease***.

**Patents: USPTO # 16303371, 2018; EP #16903293.5, 2108**

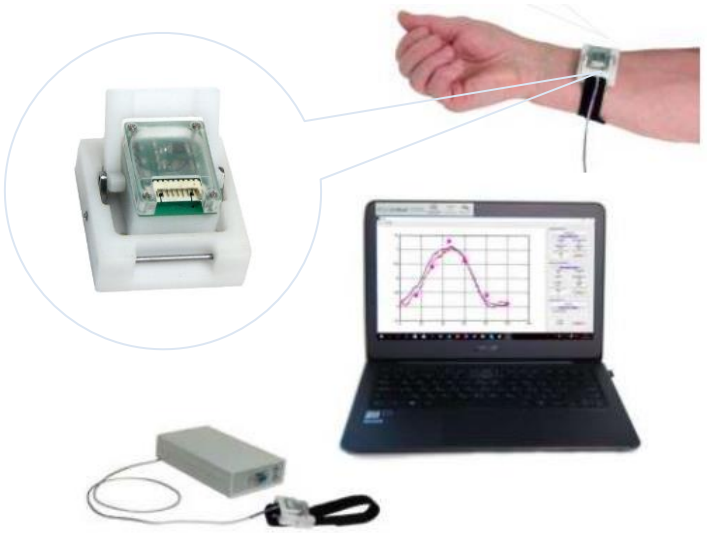
# The Product

***LCM Biosensor*** **allows continuous noninvasive measurement of living tissue parameters in real time in three modes:**

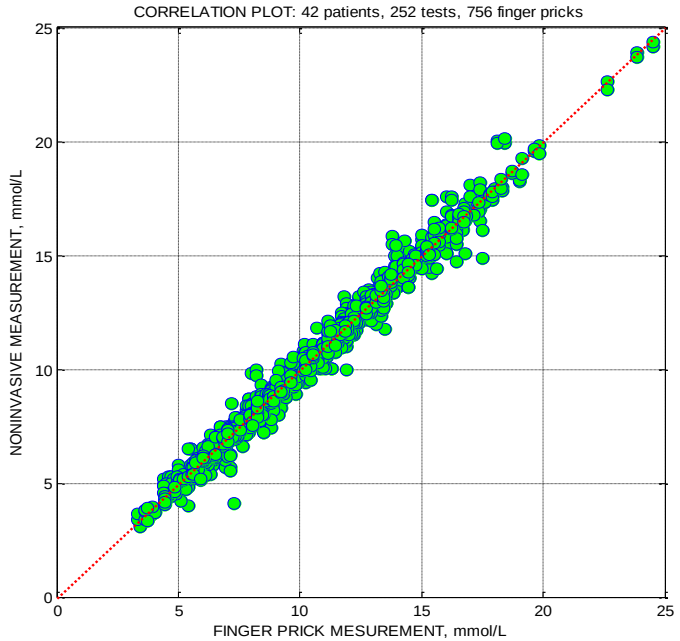
- ***scanning intercellular microfluidics calorimeter*** **– measures the enthalpy change occurring in intercellular substance and thermal effects of cell metabolism;**
- ***intercellular glucose biosensor*** **– blood glucose monitoring;**
- ***microcalorimeter – spectrometer*****: spectroscopy of living tissues biochemistry (glucose, hyaluronic acid, triglyceride, water and others).**

R&D INTERCELL

# The Prototype & MVP



The prototype device that has been used in clinical proof of concept study with diabetic and healthy subjects.



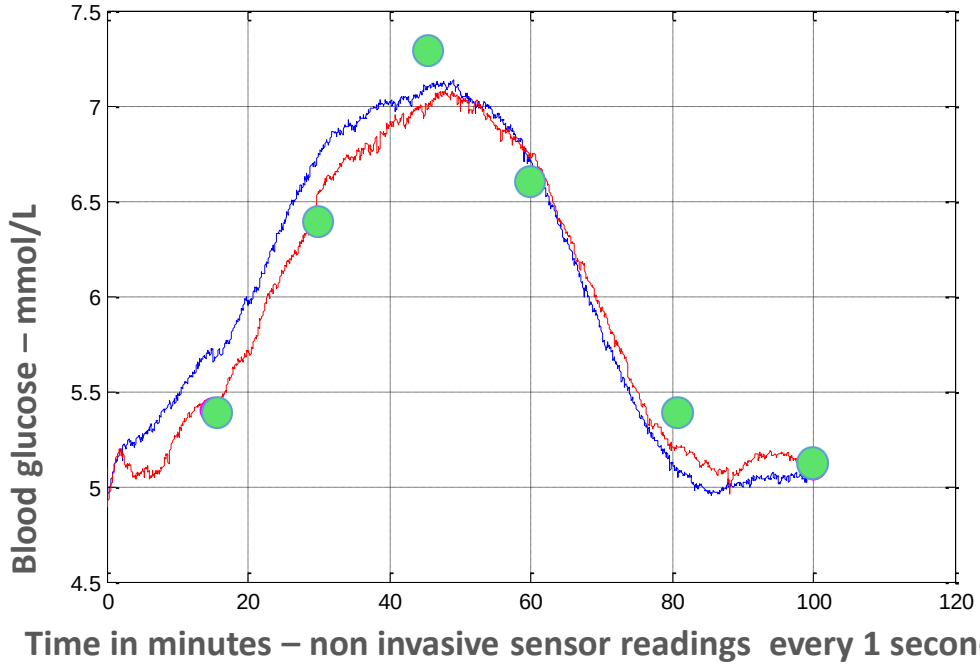

Our solution has been validated in a proof of concept clinical study with 42 diabetic subjects with total 252 tests with 30 minutes duration of each test, which compared performance of our device prototype to that of FDA-approved conventional finger-prick glucometers .

# Proof - of - Concept Study: Method Comparison

Here is an example of comparison measurements during Glucose Tolerance Test of healthy patient.

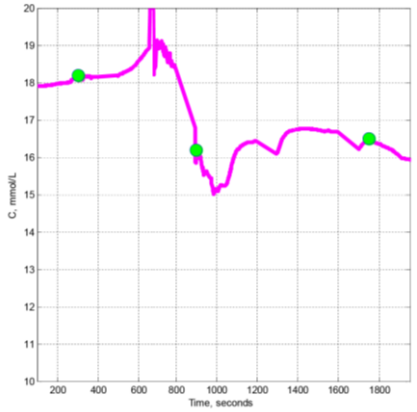
We can see good correlation between non-invasive sensor readings of 2 channels prototype and finger prick measurements.

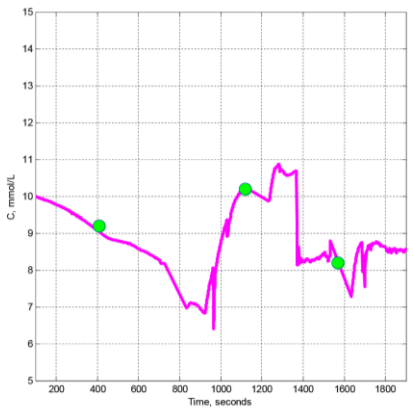
Oral Glucose Tolerance Test (OGTT) of healthy patient.

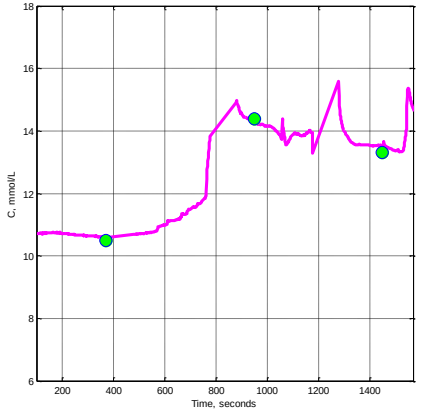



* Using a commercial device "Accu Check active" to detect sample glucose level

# Proof - of - Concept Study: Method Comparison




Non-invasive measurement

Invasive finger-prick*

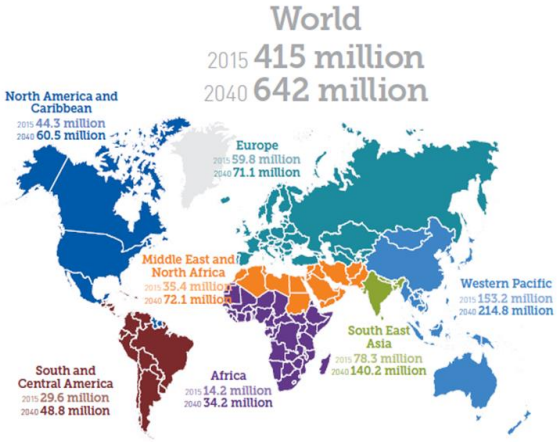
* Using a commercial device “One Touch Verio Pro” to detect sample glucose level

**Here is an examples of comparison measurement with diabetic person. Unlike the smooth monitoring dynamics of a healthy patients, the dynamics of diabetics has a spasmodic nature with possible jump changes of blood sugar level.**

# Market

**The non invasive glucose monitoring device has a global market targeting more than 415 million diabetic patients.**

**The consumer version of device has a global market exceeding the multi billions diabetics market at least 10 times.**




| | dexcom | OptiScan | CNOGA MEDICAL | Senseonics |
|---|---|---|---|---|
| Post-Valuation ($M) | $340 | $211 | $217 | $187 |
| Last Investment ($M) | $56 | $29 | $50 | $20 |

Market leaders and newcomers

Roche, Bayer, Abbott, LifeScan, Panasonic, Sanofi, Walmart, Target

Apple, Samsung, Biostrap

Source: *Dow Jones, venturesource database*

# Intellectual Property

**Patents & Academic publications:**

1. **Patent RU № 2629796, 2016.**
2. **US patent application, USPTO # 16303371, 2018**
3. **European patent application, EP #16903293.5, 2108**
https://worldwide.espacenet.com/publicationDetails/originalDocument?CC=EP&NR=3466320A1&KC=A1&FT=D&ND=3&date=20190410&DB=EPODOC&locale=en_EP
4. **PCT patent application, Nov. 18, 2019**
5. **Academic publications, in progress**