

MICA BIOSYSTEMS

DYNASCREENTM INFORMATION PACK

CONTACT US Website: www.micabiosystems.co.uk LinkedIn: https://www.linkedin.com/company/mica-biosystems Email: info@micabiosystems.co.uk



Introduction

MICA Biosystems (MICA) uses cuttingedge, First-in-Class nanotechnology to enable researchers around the world to push further this frontier of science and medicine. MICA Biosystems, including its related products Dynagrow[™]and Dynascreen[™], are protected by seven worldwide patents

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			100000000000000000000000000000000000000
	reclinical biotech compa		
	e fields of regenerative te		
	ed by a dynamic 26-year-		
he wake of the compar	ry being named in the Bi	otechnology Awards 202	12.
MCA.Booystems	are no lengthy (and could); coll	cells in both the clinical and	Contraction No.
(MICA) uses cutting-	culture steps to speak of. So, let as	research fields by allowing for	anna manna
edge, First-in Class nanolechnology to	have a closer look at how It works.	controlled cell differentiation and mechanical stimulation,	
enable researchers	"Nanoparticles with a	both in you and in you. This	
around the world to push further	magnetic core, coaled with a	will enable a new approach	10 Co
his frontier of science and	biccompatible layer, are linked to	to controlling cell behaviour with applications in tissue	and the second s
nedicine, truly unlocking the potential of stem cells to read	one or more binding molecules." Alicia el Haj elaborates. "The	with applications in teaue engineering and regenerative	
invitring ranging from spinal	tagged nanoparticles bind to	medicine, stom pell research,	and the second second
rijuries and diseases, to tendon	ion-channels or other molecular	pharmaceutical screening, and	
lamage, neurodegenerative	receptors on the cell membrane.	therapeutic applications.	investment to tuel the company's extraordinary ambitions.
Senaces and oncology.	By subjecting the cells to a time- varying magnetic field, energy	Leading figure in Bioengineering	constant and an over
We developed a disruptive	is transforred to the magnetic	and Regenerative Medicine,	Recently, the company was
sided-platorn sanded-mology	particles, which causes the	Alicia has been involved in	recognised in the Clobal Health & Pharma Bistechnology Awards
which creates remote-controlled	specific receptor to be activated. This leads to protein regulation	bringing together interdeciplinary groups within biomedicine.	5 Pharma Dutechnology Awards 2022 for its ground-breaking
of beginning Phase 1 clinical	and controlled cell responses."	maths, physical sciences, and	work and bestowed with the title
tials after successful pre-clinical		engineering. She has been	of Stem Cell Therapy Innovators
rials," Mike Zurawski orthuses. This technology answors the	In addition to potentially improving and saving the Ives	awarded the IOM3 Chapman medial for her major contribution	of the Year in the UK. And right now, the future is looking very
undamental problem of selective	of millions of patients around the	towards translation of biomedical	good indeed, with the company
dam cell-differentiation, and holds	workt, the technology can also	materials into healthcare	opening its next equity raise in
he potential to truly revolutionise	be used for drug screening by	and is also ex-chair of the European Council for the Tasue	early G2 of 2022.
he field of regenerative medicine- pringing it from the tringes to the	inducing a dynamic environment for drug somening through	Engineering & Regenerative	"We have recently concluded our
nainstream of medicine. Stem cells	the patented Dynascreen**	Medicine International Society	successful pre-clinical trials and
n their current form are placed into a patient and are hoped to	platform- ensuring potentially beneficial drugs aren't screened	(TEFMIS), and co-Founder Jon is one-of the Top 50 most highly	are gearing up to start Phase 1 human trials; paving the way to
etts a parient and are hoped to reads the desired tissue purely	beneficial drugs aren't screened out needlessity during their	cited researchers in regenerative	patients around the world," Mike
saled on their environment - which-	proclinical slages. Further	medicine in the world.	finalises. 'The initial therapy
sas a high failure rate. Through sandtechnology, we allow citricians.	capitalising on the possibilities of nanotechnology, MCA has	CEO Mile Zurawski completed	area we focus our attention on is Spinal Fusion- changing what is
is select the type of fissue they	developed a biomactor capable	his PhD in the field of	currently an invasive surgery into
rould like to preate in situ."	of growing cells and organoids	biotechnology in collaboration	an outpatient injection procedure.
This Parryte-Controlled Stem	in a dynamic, mechanically stimulated environment to	with the multinational plant, Zenner-Biomet, Since he	We aim to add years to the lives of patients and add life to their years
Dell Therapy holds the promise	open the window into scientific	began his tenure at MICA.	by increasing their quality of the?
b evolve regenerative medicine	research around disease,	biosystems, he has seen the	Contact: Dr. Miles Zurgenski,
a sector a regenerative constant of	development and discovery.	business go from strength to strength- advancing pro-	Contact: Dr. Mike Zurzwski, miked/micebiosystems.co.uk
and improve the quality of life of	MICA's mission is simple:	clinical trials, proving the team,	Company: MICA Biosystems
and improve the quality of life of millions of people worldwide and importantly, is not hadilional coll	to unlock the potential of	structuring a brand-new Board of	Web Address
and improve the quality of life of millions of poople worldwide and importantly, is not hadiblenal coll hexige at all- in that it uses the		Directors and attracting external	www.micabloopstema.co.uk
and improve the quality of life of millions of people worldwide and importantly, is not hadilional coll	nanotechnology and stem	concert and making comma	
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and improve the quality of life of millions of poople worldwide and importantly, is not hadiblenal coll hexige at all- in that it uses the			intechnology Awards 2022, 13
and improve the quality of life of millions of poople worldwide and importantly, is not hadiblenal coll hexige at all- in that it uses the			istechnology Awards 2022, 13

OUR COMPANY



MICA CELL THERAPY

We use nanoparticles and an induced magnetic field to actively and accurately control the differentiation of stem cells *in vivo*, in a highly location-specific, minimallyinvasive procedure.

Dynascreen™

Dynascreen™provides mechanical stimulation to cells in a permeability assay as a bolt-on addition to existing instrumentation and methodologies.

Dynagrow™

We use nanotechnology and magnetic forces to provide mechanical stimulation to cell cultures, facilitating 3D structure and organoid cell cultures, using our patented instrumentation. PAGE | 03

DYNASCREEN™

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PROBLEM

Drugs are often screened out due to the permeability assessments using Caco-2 assays. Drug discovery and development is a long, costly, and high-risk process:

> Typical length: 10-15 Years Typical cost: \$1-2 Billion

Preclinical studies account for 32% of drug discovery costs.

Solution

Dynascreen is a bolt-on device to the standard Caco-2 assay, with oscillating magnetic fields. These create mechanical movement in the cell lining, which has been previously tagged with MICA's magnetic nanoparticles (MNPs).



Them

The standard Caco-2 assays are static. That is an inaccurate representation of the *in vivo* intestinal environment which is subject to constant movement.

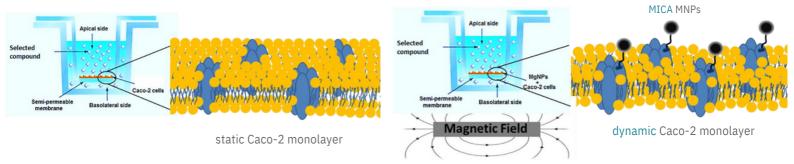


Movement drastically changes the membrane permeability.

We provide that movement.

Conventional assay

MICA dynamic assay



Dynascreening in practice

Dynascreen is a bolt-on device to the standard Caco-2 assay

add labelling solution containing MNPs to the apical region of each well

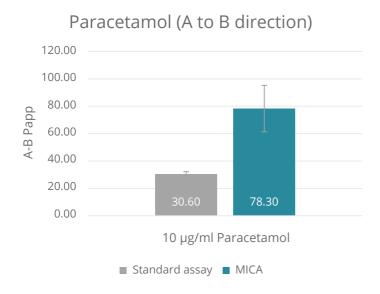


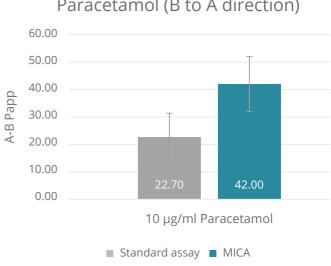
add drug solution to the assay as per usual

incubate labelled cells for 2hrs at 37°C with magnetic stimulation place plates directly onto the magnetic plate and incubate for 30min

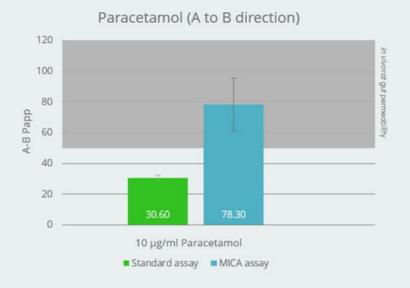


Data - paracetamol permeability





Paracetamol (B to A direction)



Our target

In vivo rat intestinal permeability measured at 50-200 x 10^-6 cm/s

These levels are similar to MICA Dynascreen assay compared to lower static levels

Compound	Permeability Direction	Papp standard assay (nm/s ±S.D.)	Papp Dynamic assay (nm/s ±S.D.)	% of Papp increase from standard to dynamic assay
Paracetamol (Class III)	Apical to Basolateral	30.6 <u>+</u> 1.6	78.3 <u>+</u> 17	156%
	Basolateral to Apical	22.7±8.7	42 ±10	85%

Dynascreen[™] package

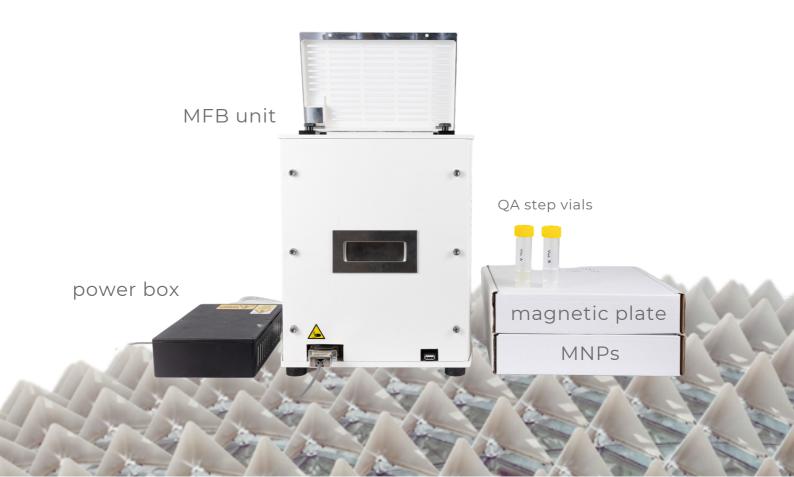
1. BIOREACTOR UNIT

this instrument provides a dynamic or static magnetic force to biological material labelled with MICA MNPs

unit comes with a power box, magnetic plate and software

2. ASSAY BOX

containing MICA MNPs sufficient for 330 wells (13 x 24-well plates) and vials for an optional QA step



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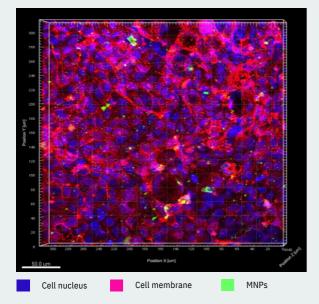
summary



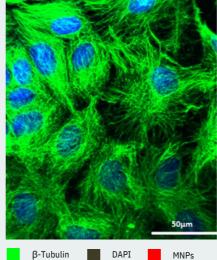
Dynamic drug absorption in Caco-2 cells can be up to 150% greater than static absorption assays

Class IV compounds which showed limited absorption in static assays show absorption in our Dynascreen[™]assays

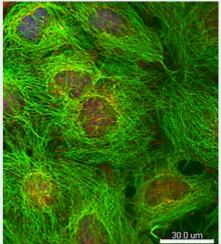
Dynascreen™is the first dynamic Caco-2 drug screening assay of its kind to accurately predict *in vivo* human drug absorption rates



Caco-2 without MNPs



Caco-2 labelled with MNPs



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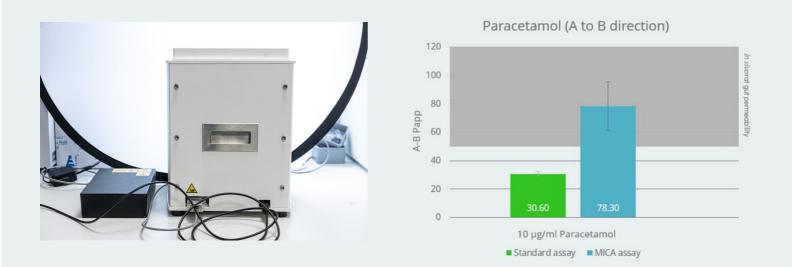
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summary



Dynamic drug absorption in Caco-2 cells can be up to 150% greater than static absorption assays Class IV compounds which showed limited absorption in static assays show absorption in our Dynascreen[™]assays Dynascreen[™]is the first dynamic Caco-2 drug screening assay of its kind to accurately predict *in vivo* human drug absorption rates



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MCA Biosystems

COMPANY NUMBER 07237355

MICA Biosystems', including its related products Dynagrow[™] and Dynascreen[™], are protected by seven worldwide patents.