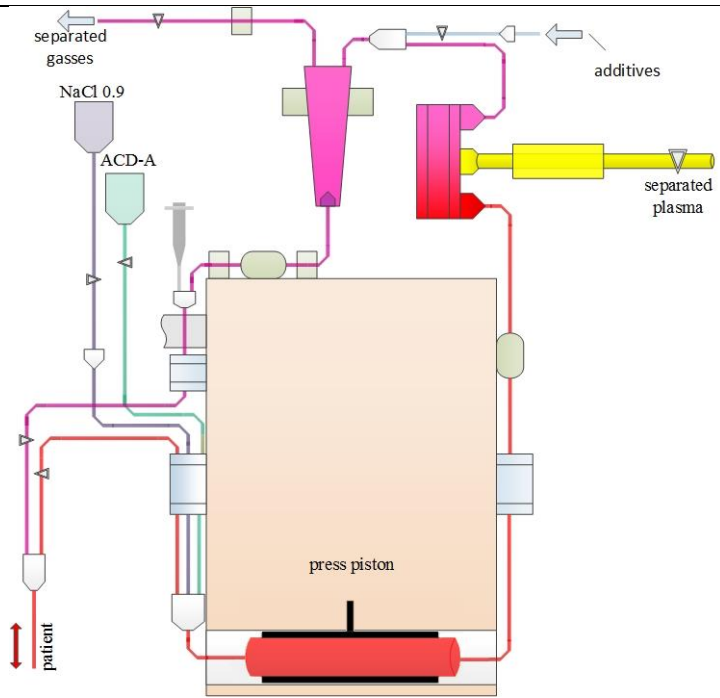
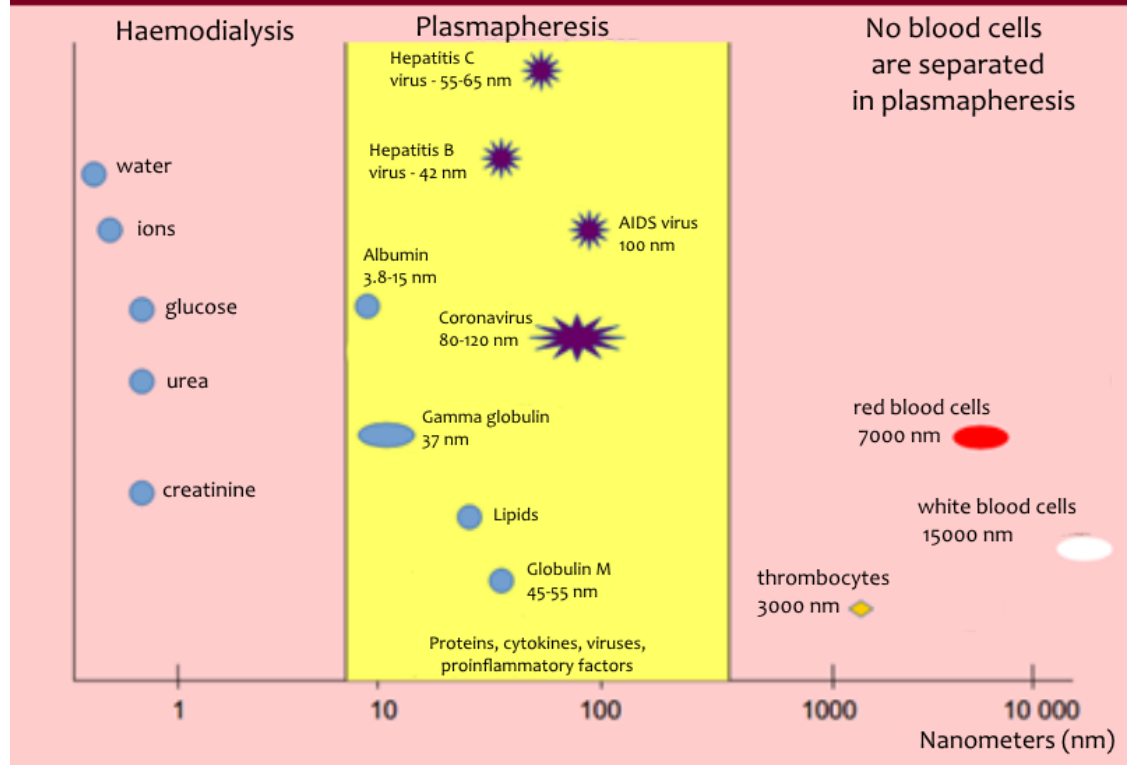


GENERAL INFORMATION

1. NAME OF THE CENTER AND LOCATION	
	Novamed Ltd., Bulgaria, Sofia
2. TYPE OF THE RESEARCH INFRASTRUCTURE AND/OR SCIENTIFIC EXPERTISE	
Identify the type of the RI, equipment/facilities/ specific research, and in particular linked to COVID-19:	<p>Scientific equipment for biomedical and pharmaceutical research & development.....</p> <p>Apparatus represents an artificial one-chamber heart for conducting blood circulation outside the human body for therapeutic apheresis for human applications (plasma exchange, plasmapheresis, double-filtered plasmapheresis, haemoperfusion, selective plasmapheresis and protein immunoadsorption, destroyed proteins and cells, cytokines, bacteria and hepatitis virus type C, the coronaviruses group including SARS-CoV-2 (COVID-19 virus).The apparatus can be used for plasma separation for patients healed of COVID-19 and to produce an antibody (human immunoglobulin G) targeting COVID-19 treatment.</p> <p>KEY WORDS:</p> <p>Expertise in therapeutic apheresis for humans (plasma exchange, plasmapheresis, double-filtered plasmapheresis, haemoperfusion, selective plasmapheresis and protein immunoadsorption, destroyed proteins and cells, cytokines and oxidative stress. Nano membrane blood processing, plasma separation, Cyber-physical systems, High quality process control</p>
3. TYPE OF THE RESEARCH	
Provide information on the research carried on or planned in regard with COVID-19 and other viruses	<p>Experimental research is finished.</p> <p>There are produced laboratory prototype, experimental model and certification model, registered Useful model № 2901 U1 dated 30.03.2018 r from Patent Office of Republic of Bulgaria.</p> <p>The apparatus is ready for production. Currently a small pre-production series of five apparatus is under production.</p>

Membrane plasmapheresis – a therapeutic method



General scheme of an artificial one-chamber heart machine for nano-membrane plasmapheresis

4. WEBSITE

Provide the internet address:

nanopher.com

5. BACKGROUND, PUBLICATIONS AND OPEN DATA REPOSITORY

The leading research group is mentioned in the Useful model registration document № 2901 U1. Other researchers from different Bulgarian universities and the BAS participate as well.

Scientific publications of the research group

leading research team AND Scientific publications of the research group on the topics of related to coronaviruses research results; **link to open data repository**

1. Albena Momchilova, Zlatan Tsonchev, Mariana Hadzhilazova, Rumiana Tzoneva, Alexander Alexandrov, Dimitar Nikolakov, Viktoria Ilieva, Roumen Pankov. Sphingolipid metabolism is dysregulated in erythrocytes from multiple sclerosis patients. *Comptes rendus de l'Acad'emie bulgare des Sciences*. Tome 73, No 3, 2020
2. Boris Tenchov, Rumiana Koynova, Borislava Antonova, Stella Zaharinova, Silviya Abarova, Zlatan Tsonchev, Regina Komsa-Penkova, Albena Momchilova. Blood plasma thermal behavior and protein oxidation as indicators of multiple sclerosis clinical status and plasma exchange therapy progression. *Thermochimica Acta*, 671, 2019, 193-199
3. Uzunova, V. Tzoneva, R.Stoyanova, T. Pankov, R., Skrobanska, R., Georgiev, G., Maslenkova, L., Tsonchev, Z. Momchilova, A. Dimethylsphingosine and miltefosine induce apoptosis in lung adenocarcinoma A549 cells in a synergistic manner. *Chemico-Biological interactions*, 310, art.no.108731
4. Alexandrov, A., Vassileva, P., Momchilova, A., Tsonchev, Z., Kirilova, Y., Ivanova, R., Sapundzhiev, P., Petkova, D., Tzoneva, R., Daskalov, M., Orozova, M., Kenarov, P., A new approach using nanomembrane-based therapeutic plasmapheresis for treatment of patients with multiple sclerosis and neuromyelitis optica. *Comptes rendus de l'Acad'emie bulgare des Sciences*, 69 (3), 373-384, 2016
5. Кенаров П., Момчилова А., Аная Ф., Воинов В., Александров А., Цончев З., Даскалов М. ТЕРАПЕВТИЧНА АФЕРЕЗА С НАНОТЕХНОЛОГИЧНА МЕМБРАНА ПРИ ЗАБОЛЯВАНИЯ У ЧОВЕКА. Том I. Университетско издателство „Св. Климент Охридски“, София, 1-155, 2014. ISBN 987-954-07-3776-8
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7. Kolev, O., Moskov, P., Tsonchev, Z., Kenarov, P. Vestibular and ocular motor function prior and after therapeutic apheresis in multiple sclerosis // Journal of vestibular research – 2016 – Vol. 26
 8. Zlatan Tsonchev , Michaela E. Bozhilova, Marin Daskalov, Radostina Ivanova, Milka Orozova, Albena Momchilova, Alexander S. Alexandrov, Plamen Kenarov. Experience for treatment neurological and other non-neurological diseases with plasmapheresis through nanotechnology membrane in Bulgaria - Therapeutic Apheresis and Dialysis, Volume 21, Issue 5 October 2017 Pages 538–539
 9. Zlatan Tsonchev , Michaela E. Bozhilova, Marin Daskalov, Radostina Ivanova, Milka Orozova, Albena Momchilova, Alexander S. Alexandrov, Plamen Kenarov. Experience for treatment neurological and other non-neurological diseases with plasmapheresis through nanotechnology membrane in Bulgaria. Abstracts 11th Congress of the International Society for Apheresis May 17–20, 2017 Copenhagen, Denmark, First published: 12 October 2017, DOI: 10.1111/1744-9987.12636
 10. Sapundzhiev PK, Vassileva PI, Alexandrov A.S., Momchilova A., Tzonchev Z, Orozova M.. Ophthalmological parameters could indicate the safety of nanomembrane plasmapheresis in patients with relapsing remitting form of multiple sclerosis (RRMS) during remission and with neuromyelitis optica (NMO). Investigative Ophthalmology & Visual Science, 58, 8, 2017 ASSOC RESEARCH VISIONOPHTHALMOLOGY INC, 12300 TWINBROOK PARKWAY, ROCKVILLE, MD 20852-1606 USA, 2017, ISSN:0146-0404
 11. J. Krlev, B. Ivanov, I. Evg. Ivanov, A. Yonchev, D. Georgieva, An approach for perfusion pump control for nanofiltering, Proceedings of the Technical University of Sofia, Volume 67, Issue 2, 2017
 12. Vesselin Gueorguiev, Ivan Evg. Ivanov, Borislav Ivanov, Quality Assurance Analysis of a Perfusion Pump Embedded Controller, PROCEEDINGS OF TECHNICAL UNIVERSITY OF SOFIA, Volume 68, Issue 2, 2018, pp. 209-214
 13. Borislav Ivanov, A model of extracorporeal perfusion pump, 7th Mediterranean Conference on Embedded Computing MECO'2018, Budva, Montenegro, June, 2018, pp. 523-526, ISBN 978-1-5386-5682-2, IEEE Catalog Number: CFP18397-PRT
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14. Borislav Ivanov, Maria Nenova, Desislava Georgieva, Extensive quality assurance analysis of a perfusion pump embedded controller, PROCEEDINGS OF TECHNICAL UNIVERSITY OF SOFIA, Volume 69, Issue 2, 2019, pp. 279-286
15. Vesselin Gueorguiev, Ivan Evg. Ivanov. Software structure and time analysis of extracorporeal perfusion pump controller, PROCEEDINGS OF TECHNICAL UNIVERSITY OF SOFIA, Volume 69, Issue 2, 2019, pp. 247-252
16. Ivan Evg. Ivanov, Vesselin Gueorguiev, Desislava Georgieva, Software structure, program generation and schedulability analysis of extracorporeal perfusion pump embedded controller, 8-th Mediterranean Conference on Embedded Computing MECO'2019, Budva, Montenegro, June, 2019, pp. 279-283, ISBN 978-1-7281-1740-9/19
17. Borislav Ivanov, Jordan Kralev Re-structuring, Quality Assessment and Telemedicine Integration of an Extracorporeal Perfusion Apparatus Controller, 8-th Mediterranean Conference on Embedded Computing MECO'2019, Budva, Montenegro, June, 2019, pp. 687-690, ISBN 978-1-7281-1740-9/19

6. COORDINATOR

Novamed Ltd.

Contact person;

Martin Diankov

e-mail mdiankov@gmail.com

7. POSSIBLE PARTNERS

Indicate the partner organizations

Technical University Sofia

Contact person;

Ivan Evgueniev Ivanov

e-mail iei@tu-sofia.bg

8. IMPLEMENTED AND RUNNING PROJECTS

Projects related to virology, vaccines, infection diseases ...

FNI D01/3 2016 (current)

EN-“Study of oxidative stress in some neurological diseases before and after administration of nanomembrane in therapeutic apheresis”

BG- “Проучване на оксидативния стрес при някои неврологични заболявания преди и след приложението на наномембрана при терапевтична афереза” –

Project proposal BG16RFOP002-2.040-1283 accepted, waiting funding under
National PROGRAMME - BG16RFOP002-2.040

EN-“Development of competences-Improving production capacity of small and
medium-sized enterprises (SMES)”

BG-„Подобряване на производствения капацитет в малките и средни
предприятия“