The greatest use of a life is to spend it on something that will outlast it.

William James
B.V. Afanasyev – student of First Pavlov Medical University (1965-1971)

1966
1970
1972
1971
1970
1971

Academician, prof. Almazov V.A. Prof. Blagosklonnay Jn.V.
Chair of Faculty therapy, Pavlov University
(till 1994 - I.P.Pavlov First State Medical Institute of Leningrad)

Experimental assay of Chair of Faculty Therapy held a leading position in the USSR in research of hematopoietic and mesenchymal stem cells in health humans and in various diseases

Lang G.F.
(1975-1948)

Istamanova T.S.
(1900-1986)

Almazov V.A.
(1931-2001)
Cell culture, modified B.V. Afanasyev

**Marbrook system**
(Golde & Cline, 1973, modified Afanasyev B., 1979)

**New culture system**
«agar drop – liquid culture»

- 0.5% agar + blood leukocytes (CSF source)
- 0.3% agar + bone marrow mononuclear cells

B.V. Afanasyev, 1982
Main direction of research

Difference in types of growth in blast crisis of chronic myeloid leukemia – myeloid - lymphoid

Differentiation of leukemic cells in vitro under the influence of low concentrations of cytostatics (Ara-C)

The effect of various concentrations of cytostatics on leukemic cells

Study of growth types in vitro in acute leukemia in children – first assay for MDS in children

Study of growth types in vitro in bone marrow failure of various etiologies – AA, MDS, AML or secondary etiology

BM colony-forming capacity

Using of BM colony-forming capacity for differential diagnosis

OS patients with MDS depending on type of growth

Growth type:
I – hypoplastic, II – normal, III – hyperplastic,
IV – leukemic

Abscissa – cluster-forming capacity,
Ordinate – colony-forming capacity, per 1x10⁵ myelocariocytes

normal or hyperplastic growth type
leukemic or hypoplastic growth type
The first publications dedicated to children MDS

The Preleukemic Syndromes (Hematopoietic Dysplasia) in Childhood
E. Kreisler

1982 – The first experimental data confirmed of MDS in children

Cloning GM-CFU in modified Pike&Robinson and “agar drop-liquid system” (culture (Afanasyev B.V., 1976, 1982)

Marbrook’s system (Golde&Cline, 1973) , modified Afanasyev B.V.1979

7
1980 - First clinical success of cyclophosphamid in AA patient without allo-HSCT

History of cyclophosphimide in aplastic anemia

I- bands;  
II- erythrocytes;  
III – platelets

R. Brodsky, 2018
Intramedullary humoral and stromal regulation of hematopoiesis in normal and pathology

1985 - The first monograph in the literature dedicated human hematopoietic stem cells

B.V.Afanasyev, V.A.Almazov, 1985

Patent for invention:
«The method of obtaining growth factors of a protein nature, a growth factor of a protein nature and an inhibitor of fibroblast proliferation», 2006
B.V.Afanasyev, G.Wagemaker, L.Zubarovskaya
First HSCT implementation in Russia: training of B.V.Afanasyev (Leningrad) and V.G.Savchenko (Moscow) at the Fred Hutchinson Cancer Center in Seattle (USA). 1986

The Nobel Prize in Physiology or Medicine 1990 was awarded E. Donnall Thomas (1920-2012) "for their discoveries concerning organ and cell transplantation in the treatment of human disease."

Prof. R. Hickman – the founder of central venous catheter, Seattle, 1986
1. HSCT is a complex, science-intensive medical technology that requires a highly professional multidisciplinary team: hematologists, oncologists, transfusioiologists, pediatricians, surgeons, etc.

2. HSCT technology in adults and children is practically the same. The best option is to organize mixed clinics.

3. The best results are observed in patients with early stages of the disease and in remission at the time of BMT, but in reality such patients are a minority. It is necessary for medical, ethical and social reasons to carry out BMT in patients with so-called “salvage” group.

4. The optimal option – opening of BMT Unit at University Clinic

5. In Russia, it is necessary to create a register of bone marrow donors.
The beginning of close cooperation with Hamburg University Hamburg, 1988

E.Frolova, I.Chertkov, E.Elstner, H-M.Neth, R.Neth, B.Afanasyev, A.Fridenstein (from left to right)

Prof Zander A.
1991 - The first allogeneic bone marrow transplantation for children in Russian Federation

Patient P.L., boy, 5 y.o.  
Diagnosis: ALL, Ph(+), 3d relapse (photo 1999)

1992  
Patient E.B., girl, 10 y.o (AML, 1 CR) was consulted by Prof. T. Buchner before MFD allo-BMT (16.04.1992)

2003 Patient with donor

1992  
Patient E.B., girl, 10 y.o (AML, 1 CR) was consulted by Prof. T. Buchner before MFD allo-BMT (16.04.1992)

2003 Patient with donor

CIC 725

Prof. A.Zander, Hamburg University, Germany

28.07.2010
2001 - The start of programme for allogeneic bone marrow transplantation from unrelated donor in Russian Federation

2006 – The first Haplo-HSCT

MUD Allo-HSCT, 15.03.2001
Sh.Yu., 20 y.o., CML

MUD Allo-HSCT, 27.07.2001,
K.A., 6 y.o., AML, 1 CR

In 2000 the first Russian University Clinic for bone marrow transplantation was opened in Pavlov University together with the European Institute for the Support and Development of Transplantation (Germany)

Mr. E. Morsch - founder of registry

10 years after
September 20, 2007

Opening ceremony of R.Gorbacheva Memorial Research Institute of Children Oncology, Hematology and Transplantation in First Pavlov State Medical University of St.Petersburg
Patients coming to the RM Gorbachva Research Institute for Pediatric Oncology, Hematology and Transplantation from various regions of Russia
The number of HSCT in First Pavlov State Medical University of St. Petersburg since 2000 till 09/2020 (CIC 725)

Overall - 4439
The overall number of diseases and HSCT (2000-2020)

**Adults N=2781**
- Auto-HSCT
  - MM: N=406
  - HD: N=206
  - NHL: N=164
  - Solid tumor: N=62
  - Autoimm: N=55
  - AML: N=42
  - ALL: N=15
  - CNS: N=2
  - CML: N=1
  - Others: N=1

**Overall N=4439**
- Allo-HSCT
  - MUD: N=959
  - MRD: N=462
  - Haplo: N=355
  - AML: N=760
  - ALL: N=386
  - CML: N=167
  - MDS: N=108
  - HD: N=97
  - NHL: N=79
  - AA: N=75
  - PMF: N=57
  - MPD: N=19
  - MM: N=19
  - Solid tumor: N=297
  - CNS: N=141
  - HD: N=71
  - NHL: N=32
  - ALL: N=25
  - AML: N=10
  - MDS: N=2

**Children N=1658**
- Allo-HSCT
  - MUD: N=466
  - MRD: N=433
  - Haplo: N=181
  - ALL: N=448
  - AML: N=272
  - Inherited: N=111
  - AA: N=68
  - MDS: N=56
  - JMML: N=45
  - CML: N=18
  - HD: N=14
  - NHL: N=7
  - Others: N=2
Overall survival after MUD&HAPLO allo-HSCT in adults ALL&AML remission patients (n=671)

MSD- 170, MUD– 398, Haplo - 103
Allo-HSCT with different intensity conditioning regimens in children with acute leukemia (HRG): 20 years of experience  RIC vs MAC

OS of children with CR ALL after allo-HSCT

OS of children with CR AML after allo-HSCT

Late Effects

Growth retardation and endocrine dysfunction were significantly less frequently observed in patients after RIC

SD deviation of children’s growth 1, 5 and 10 years after allo-HSCT

<table>
<thead>
<tr>
<th>SD deviation</th>
<th>In 1 year</th>
<th>In 5 years</th>
<th>In 10 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RIC 30</td>
<td>MAC 60</td>
<td>p</td>
</tr>
<tr>
<td>-16 – +1 δ</td>
<td>21</td>
<td>22</td>
<td>0.052</td>
</tr>
<tr>
<td>-16 – -2 δ</td>
<td>6</td>
<td>16</td>
<td>0.043</td>
</tr>
<tr>
<td>-26 – -3 δ</td>
<td>3</td>
<td>18</td>
<td>0.021</td>
</tr>
<tr>
<td>&lt; -3 δ</td>
<td>0</td>
<td>4</td>
<td>0.012</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

Endocrine dysfunction

<table>
<thead>
<tr>
<th></th>
<th>RIC n=30</th>
<th>MAC n=60</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothyroidism</td>
<td>1 (3%)</td>
<td>9 (15%)</td>
<td>0.034</td>
</tr>
<tr>
<td>Adrenal deficiency</td>
<td>2 (6%)</td>
<td>11 (18%)</td>
<td>0.045</td>
</tr>
</tbody>
</table>

CIC 725
2000-2019
Allo-HSCT results is improving (1996-2017)

- GVHD prophylaxis & infection therapy
- “Bridge” therapy + Immunotherapy

5-years OS

Cum Survival

N=1500


TRM

Relapse

Months after allo-HSCT

p<0.0001

5-years OS

25.51% 32.33% 33.88% 26.41%

2000 2005 2011 2017
Evolution of GVHD-prophylaxis regimens in RM Gorbacheva Research Institute

1990s
- Cyclosporine + Methotrexate \(N=150\)

2000s
- Serotherapy studies (ATG, ALG) \(N=1006\) in unrelated transplants

2006
- Cyclosporine and MMF \(N=51\)

2007
- Tacrolimus instead of cyclosporine \(N=633\)

2009
- T-cell depleted haploidentical SCT \(N=66\)

2013
- High-dose post-transplant cyclophosphamide \(N=716\)

2018
- Post-transplantation bendamustine \(N=30\)

Incidence of acute GVHD grade II-IV after MRD and MUD Tx

\(N=1295\)
Treatment of acute and chronic GVHD at R.M. Gorbacheva Institute

Acute GVHD II-IV, number of pts treated

Extensive cGVHD, number of pts treated

Survival of patients with aGVHD grade II-IV after MRD and MUD

Cumulative Survival

Days after HSCT

N=367
p=0.03
Allo-HSCT is an effective method of therapy for all types pediatric MDS
There is no difference in efficiency of RIC and MAC.

RC 15, RAEB 18, RAEB-t 19, JMML 19
Allo-HSCT results in adult MDS patients
R.M. Gorbacheva institute experience (N=67)

Median:
Age 44 y.o.
Time to HSCT 10 mo.
Ferritin 898 ng/ml
DRI score 3
HCT-CI score 1
EBMT score 2,5
CD34+ cells/kg: 5x10^6

- A trend of OS improvement due to reduction of post-transplant relapses and TRM: donor selection, pre- and post-transplant therapy (HMA), RIC, PTCy, chelation therapy, supportive care etc.

Graft failure 11%

PAM est. 2-y surv. 44%

Causes of death:
- relapse 25%
- NRM 28%
10-year overall and event-free survival in CML patients after allo-HSCT with reduced-intensity conditioning regimen (n=109)

MAC (n=5)
RIC (n=109)
CP1 = 17.4% (20)
CP >1 = 48.7% (56)
AP = 23.4% (28)
BC = 17% (10)
Median age 37 (18-66) years
Results of allo-HSCT in RMGorbacheva Research Institute:
2-years OS, N=39

- Allo-HSCT after 2015 (N=30) - 72%
- Allo-HSCT before 2015 (N=9) - 22%
- P=0.018

Full donor chimerism - 95%
Spleen regress - 92%
Fibrosis of bone marrow, regress >100 days - 61%
Relapse - 2 pts, second allo-HSCT – 1 pt, DLI – 1 pt

Response to Rixolitinib before allo-HSCT

Afanasyev B.V., Barabanchikova M.V., Morosova E.V, 2016
A Paradigm shift—target and immunotherapy (immunochemotherapy) are becoming the dominant methods of treatment of malignant diseases.

Treatment principles in oncology

Old paradigm

- Surgery
- Chemotherapy
- Radiotherapy
- Immunotherapy
- Target therapy
- Gene therapy
Breakthrough in the treatment of resistant Hodgkin lymphoma was achieved due to development of immunotherapy.

- **Chemotherapy**
  - Median follow-up of survivors 50 months (75% of cases > 34 months)

- **Brentuximab vedotin**
  - OS 73.5%
  - Follow up 18 mo.
  - n=98
  - Afanasyev et al, 2016

- **PD-1 inhibitors**
  - OS 95%
  - Follow up 38 mo
  - n=116
  - Afanasyev et al, 2018

---

**Evolution of R/R cHL therapy**

- **Chemotherapy**
- **Brentuximab vedotin**
- **PD-1 inhibitors**
Pavlov University is an international center of hematological tumors immunotherapy

The experience in the treatment of malignant lymphomas with nivolumab at Pavlov University

<table>
<thead>
<tr>
<th>Overall patients</th>
<th>206</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hodgkin lymphoma</td>
<td>168</td>
</tr>
<tr>
<td>Non Hodgkin lymphoma</td>
<td>38</td>
</tr>
<tr>
<td>Median age</td>
<td>32 yo</td>
</tr>
<tr>
<td>After alloHSCT in lymphomas</td>
<td>10</td>
</tr>
<tr>
<td>From other regions and countries</td>
<td>~85%</td>
</tr>
</tbody>
</table>
Target and immunotherapy of Non-Hodgkin lymphoma

CIC 725 experience

**Nivolumab/chemotherapy (n=23)**

- **Overall and progression free survival (BeGeRN)**

- **Blinatumomab (n=9)**

**Polatuzumab vedotin (n=18)**

- **Overall and disease free survival (IO)**

- **Inotuzumab ozogamicin (n=14)**

**Diagrams and tables showing outcomes and survival data**

* n=9 ORR 33%, Med. OS 6 mo.*
Transplantation in plasma cell dyscrasias: autologous transplantation at RM Gorbacheva Research Institute

Results of autologous HSCT at R.M.Gorbacheva Institute according to induction therapy

Auto-HSCT in various plasma cell dyscrasies
n=364

- Multiple myeloma: 5% (n=18)
- AL amyloidosis: 1.4% (n=5)
- AL amyloidosis +MM: 92% (n=335)

Transplantation in Multiple Myeloman=350

- Auto-HSCT: 4.3% (n=15)
- Allo-HSCT: 95.7% (n=335)

10-years progression free survival

N=163

- CR: 54%
- VGPR: 38.8%
- PR/Stable: 29%

Response to induction: major predictor of outcome
Clinical program HIV & hematological malignancies | CIC725
n=227

Allo-HSCT
n=5
allo-HSCT in high risk acute leukemia in HIV-infected patients since 2009

Auto-HSCT
n=13
Prospective single center study on auto-HSCT in HIV-related lymphoma since 2016

Immunotherapy
n=9
Prospective single center study on immunotherapy ICI’s of Lymphoma in HIV since 2017

Chemotherapy
n=222
Retrospective multicenter cooperative study on Lymphoma in HIV since 2014

Donor / CCR5 GvHD prophylaxis

<table>
<thead>
<tr>
<th>Donor</th>
<th>CCR5 GvHD prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRD</td>
<td>CsA</td>
</tr>
<tr>
<td>MUD wt/wt</td>
<td>ATG-CsA-MMF</td>
</tr>
<tr>
<td>MUD wt/wt</td>
<td>ATG-CsA-MMF</td>
</tr>
<tr>
<td>MUD del 32/wt</td>
<td>ATG-CsA-MMF-Maraviroc</td>
</tr>
<tr>
<td>MUD wt/wt ; Haplo wt/wt</td>
<td>PTCY-Tacro-MMF-Maraviroc</td>
</tr>
</tbody>
</table>

2-year overall survival:
- MRD: 92.3%
- MUD wt/wt: 88.9%
- MUD del 32/wt: 73.9%
Pediatric Solid Tumors Department

OS in auto-HSCT recipients (n=318) 2008-2019

**Most common therapy indications 2017-2019**

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>N of patients</td>
<td>145</td>
<td>157</td>
<td>330</td>
</tr>
<tr>
<td>Neuroblastoma</td>
<td>55 (38)</td>
<td>56 (36)</td>
<td>96 (29)</td>
</tr>
<tr>
<td>CNS tumors</td>
<td>36 (25)</td>
<td>32 (20)</td>
<td>51 (16)</td>
</tr>
<tr>
<td>Hodgkin lymphoma</td>
<td>25 (17)</td>
<td>28 (18)</td>
<td>62 (19)</td>
</tr>
<tr>
<td>NHLs</td>
<td>14 (11)</td>
<td>12 (8)</td>
<td>37 (11)</td>
</tr>
<tr>
<td>Bone tumors</td>
<td>10 (8)</td>
<td>8 (5)</td>
<td>18 (5)</td>
</tr>
<tr>
<td>Other</td>
<td>3 (2)</td>
<td>21 (13)</td>
<td>66 (20)</td>
</tr>
</tbody>
</table>

**HSCTs number**

<table>
<thead>
<tr>
<th>HSCTs number</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autologous</td>
<td>60</td>
<td>61</td>
<td>62</td>
</tr>
<tr>
<td>Allogeneic</td>
<td>14</td>
<td>8</td>
<td>12</td>
</tr>
</tbody>
</table>
“Bridges” to allogeneic HSCT

- Hodgkin’s lymphoma: brentuximab
- Myelodysplastic syndrome/AML: hypomethylating agents
- Chronic myeloid leukemia: TKIs
- Primary myelofibrosis: ruxolitinib
- Acute myeloid leukemia: FLAG, Clofarabine
- Acute lymphoblastic leukemia: blinatumomab, nelarabine
- Paroxysmal nocturnal hemoglobinuria: eculizumab

Allogeneic HSCT
Options in the treatment of relapses after allo-HSCT

- Discontinuation of immunosuppressive therapy
- Donor lymphocytes infusion
- New target agents
  - Brentuximab vedotin
  - Immune checkpoints inhibitors
- Second haplo-HSCT
The efficacy of the second allogeneic hematopoietic stem cell transplantation in children with high risk of hematological malignancies since 2008

**Patients characteristics**

<table>
<thead>
<tr>
<th>Patients characteristics</th>
<th>n = 44</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age (v.o)</td>
<td>6 (0.8–17)</td>
</tr>
<tr>
<td>Sex, M/F</td>
<td>21/23</td>
</tr>
<tr>
<td>HLA-donor type:</td>
<td></td>
</tr>
<tr>
<td>Haplo</td>
<td>41</td>
</tr>
<tr>
<td>MUD</td>
<td>2</td>
</tr>
<tr>
<td>MRD</td>
<td>1</td>
</tr>
<tr>
<td>Diagnosis ALL/AML/MPD/MDS</td>
<td>21/14/8/1</td>
</tr>
<tr>
<td>Conditioning regimen</td>
<td>33</td>
</tr>
<tr>
<td>RIC: Melfalan-based, Treo-based FLAMSA, Bu8-10</td>
<td></td>
</tr>
<tr>
<td>MAC: BU, Treo - based (Bu16Cy, Bu12Flu, GIAC)</td>
<td>11</td>
</tr>
</tbody>
</table>

**Patients characteristics**

<table>
<thead>
<tr>
<th>Patients characteristics</th>
<th>n = 22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age (v.o)</td>
<td>8 (1–18)</td>
</tr>
<tr>
<td>Sex, M/F</td>
<td>15/6</td>
</tr>
<tr>
<td>HLA-donor type:</td>
<td></td>
</tr>
<tr>
<td>Haplo</td>
<td>19</td>
</tr>
<tr>
<td>MUD</td>
<td>1</td>
</tr>
<tr>
<td>MRD</td>
<td>1</td>
</tr>
<tr>
<td>Diagnosis ALL/AML/MPD/MDS</td>
<td>11/6/3/2</td>
</tr>
<tr>
<td>Conditioning regimen</td>
<td>21</td>
</tr>
<tr>
<td>RIC: Melfalan-based, Treo – based, ATG, Steroids (FluMel, TreoFlu)</td>
<td></td>
</tr>
<tr>
<td>MAC: BU-based</td>
<td>1</td>
</tr>
</tbody>
</table>
Allogeneic HSCT in acquired AA. Sibling vs UD
St. Petersburg, 2001-2020, n=131 (including Haplo-9)

Overall survival
Общая выживаемость

GVHD-, relapse-free survival
Бессобытийная выживаемость

MRD 98% (95% ДИ 84-100)
MUD/MMUD 80% (95% ДИ 58-91)

P=0.026

MRD 92% (95% ДИ 76-97)
MUD/MMUD 56% (95% ДИ 35-72)

P=0.0003

Данные НИИ ДОРГиТ им. Р.М. Горбачевой, ПСПбГМУ им. И.П. Павлова
Allogeneic HSCT in patients with inherited diseases

- N = 138
- Allo-HSCT from 2002 to April 2020
- Age: M - 4 y.o. (8 month.-18 y.o.)
- Gender: Male/Female 78/60 (57%/43%)

### Diagnosis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>N, %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bone marrow failure syndromes</strong></td>
<td>73, 53%</td>
</tr>
<tr>
<td>Acquired aplastic anemia</td>
<td>43</td>
</tr>
<tr>
<td>PNH</td>
<td>1</td>
</tr>
<tr>
<td>Fanconi anemia</td>
<td>14</td>
</tr>
<tr>
<td>Blackfan-Diamond anemia</td>
<td>4</td>
</tr>
<tr>
<td>Shwachman-Diamond anemia</td>
<td>2</td>
</tr>
<tr>
<td>Kostmann syndrome</td>
<td>3</td>
</tr>
<tr>
<td>Dyskeratosis congenita</td>
<td>3</td>
</tr>
<tr>
<td>Congenital amegakaryocytic thrombocytopenia</td>
<td>1</td>
</tr>
<tr>
<td>Sideroblastic anemia</td>
<td>1</td>
</tr>
<tr>
<td>Congenital dyserythropoietic anemia</td>
<td>1</td>
</tr>
<tr>
<td><strong>Inherited metabolic disorders</strong></td>
<td>45, 33%</td>
</tr>
<tr>
<td>Mucopolysaccharidosis type 1, Hurler syndrome</td>
<td>27</td>
</tr>
<tr>
<td>Leukodystrophy</td>
<td>9</td>
</tr>
<tr>
<td>Autosomal recessive osteopetrosis</td>
<td>8</td>
</tr>
<tr>
<td>Farber disease</td>
<td>1</td>
</tr>
<tr>
<td><strong>Primary immune deficiencies</strong></td>
<td>14, 10%</td>
</tr>
<tr>
<td>Severe combined immune deficiency</td>
<td>2</td>
</tr>
<tr>
<td>Wiskott Aldrich syndrome</td>
<td>7</td>
</tr>
<tr>
<td>Hemophagocytic lymphohistiocytosis</td>
<td>4</td>
</tr>
<tr>
<td><strong>Hemoglobinopathies</strong></td>
<td>6, 4%</td>
</tr>
</tbody>
</table>

**Overall survival children with non-malignant disorders undergoing allo-HSCT**

OS-71%, n=138
Clinical Rehabilitation Center
RM Gorbacheva Research Institute for Pediatric Oncology, Hematology and Transplantation, 2018-2021
Milestones of Prof. B.V. Afanasyev

• 1980 – First clinical success of cyclophosphamide in AA patient without allo-HSCT
• 1982 – First definition MDS in children
• 1983 – CML, blast crisis (one of the first investigations)
• 1985 – Monograph “Human hematopoietic stem cells”
• 1990 – First auto-BMT in Russia
• 1991 – First in Russia allo-HSCT for child (MSD)
• 1992 – First PBSCT in Russia
• 2000 – First BMT Clinic at University in Russia
• 2000 – First registration from Russia MUD allo-HSCT in EBMT
• 2006 – Start Haplo-identical allo-HSCT
• 2009 – First International Journal “Cellular Therapy and Transplantation” in Russia
• 2009 – First HIV – alloHSCT in Russia
• 2012 – Start Russian unrelated bone marrow donor programme (registry)
• 2016 – First in Russia IVF-PGD MFD allo-HSCT
• Publications – 400  Monographs – 6
• Supervisor of scientific researches (Ph.D. Thesis) - 2nd grade – 12 persons; 1st grade – 45 persons
Clinical Achievement Award  EBMT, 2018

M. Mohty, President EBMT 2015-2018, prof. Afanasyev B., Manuel Abecasis, President of 44th Annual EBMT Meeting, Lisbon, 2018 (left to the right)

Doctor Honoris Causa of Pavlov University, 10.12.2015

Prof. Afanasyev B.V.

- Medal “For services to the national public health care”
Staff
RMGorbacheva Research Institute of Pediatric Oncology, Hematology and Transplantation, Pavlov University