CAMPAIGN STATS

Subject: OneHealthDrug Discovery for Vector Borne Parasitic Diseases Survey

53
Total sent

20.75% (11)
Survey responses

66.04% (35)
Opened

45.28% (24)
Clicked

1.89% (1)
Soft bounce

Survey on research perspectives for drug development targeting vector-borne diseases and environmental impact

This questionnaire is being conducted under COST Action 21111 on “One Health drugs for Vector-Borne Diseases”, aiming to survey the current trends and status of the research and drug development for the treatment of Vector-Borne Diseases. In addition, we intend to assess the level of awareness about the sustainability and environmental impact of the process of developing drugs for parasitic Vector-Borne Diseases (PVBDs). To answer each question, please select one or more options to reply to each question.

The questionnaire is composed of 33 questions and shouldn't take more than 20 min to reply. The answers will be summarised and analysed.

From the results of this survey, we aim to develop training opportunities and guidelines to help researchers and their institutes produce more sustainable and environmentally safe compounds for the treatment of Parasitic Vector-Borne diseases.

We appreciate your time and efforts to answer this questionnaire.

1 Where is your research group based?

University of Iceland, Reykjavik Iceland

Department of Parasitology/University of Warsaw/Warsaw/Poland

Gad Baneth, Hebrew University of Jerusalem, Israel

Pharmacognosy/Medical Faculty/Banja Luka/Bosnia and Herzegovina

Molecular Biology of Ticks, Institute of Parasitology, BC CAS, Ceske Budejovice, Czech Republic

Molecular Logic Gates, University of Malta, Msida, Malta

Molecular Parasitology/i3S/Porto/Portugal

dog and cat infectious disease research mainly/Leishmania/Universitat Autònoma de Barcelona/Bellaterra/Spain

Nanotechnology Laboratory, TRANSCEND Research Center, Regional Institute of Oncology Iasi, Romania

Environmental Chemistry group, Bursa Technical Univ., Bursa, Turkey

UNISI/MedChemLab/Siena/Italy

Mosquito vectors, Dirofilaria and other parasites, Tirana, Albania.

De Duve Institute, Université catholique de Louvain, Brussels, Belgium.

School of Medicine University of Sarajevo, Sarajevo Bosnia and Herzegovina

UMR7042 CNRS-Unistra-UHA, Laboratoire d'Innovation Moléculaire et Applications (LIMA), European School of Chemistry, Polymers and Materials (ECPM), Strasbourg University 25, rue Becquerel, F-67087 Strasbourg , FRANCE

ICPVet, Department of Animal Health, Faculty of Veterinary Medicine, University Complutense of Madrid , Madrid, Spain

New Mechanisms Parasitology, Germany, Boehringer Ingelheim Vetmedica GmbH

Schmidt group/Institute of Pharmaceutical Biology and Phytochemistry/University of Muenster/Muenster/Germany

Institute of Chemical Biology/National Hellenic Research Foundation/Athens/Greece

Faculty of Chemistry and Chemical Technology, University of Ljubljana

Parasite Disease/i3S/ Porto/ Portugal

Laboratory of Microbiology, Parasitology and Hygiene/University of Antwerp/Belgium

Karen Angeliki Krogfelt , PhD prof IN Medical molecular microbiology, at Roskilde University, Dept og Science and Environment, Denmark

Organic Synthesis/Belgrade/Serbia

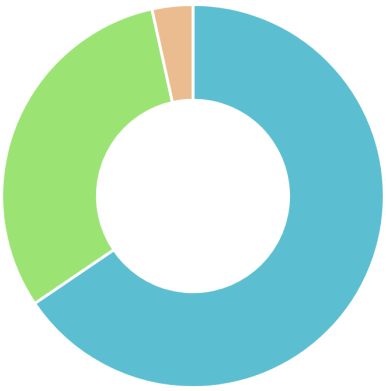
Biotechnology group/Latvian Institute of Organic Synthesis/Riga/Latvia

Computer-aided drug design/Åbo Akademi University/Turku/Finland

Laboratory of Drug discovery and biotechnology, University of Modena and Reggio Emilia, Modena, Italy

Medicinal chemistry/NKUA/Athens/Greece

2 To which group does your lab belong following the COST definition? ITC members, full members non-ITC, NNC Country or COST International partner Country?



66% (19)
Full-members non-ITC

31% (9)
ITC members

0%
NNC country

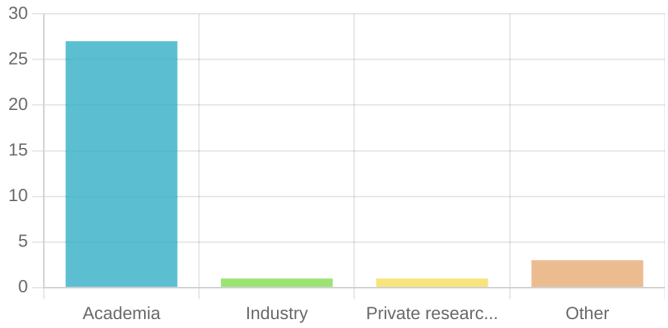
3% (1)
Partner or Cooperating Member Country

0%
International Partner Countries

(7.41)
Standard Deviation

(29)
Responses

3 Which is your research affiliation?



93% (27)
Academia

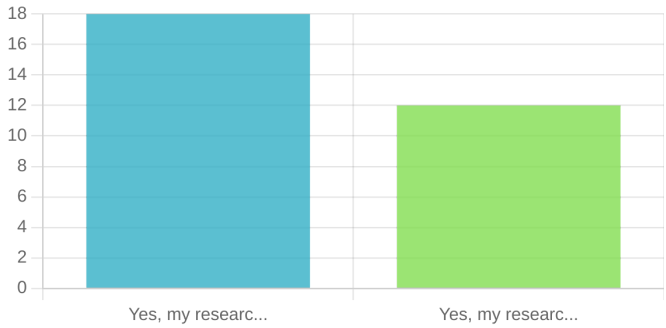
3% (1)
Industry

3% (1)
Private research foundation or institute

10% (3)
Other

(32)
Responses

4 Has your research group been directly or indirectly involved in drug development programs for the treatment of Parasitic Vector-Borne Diseases (PVBDs)?

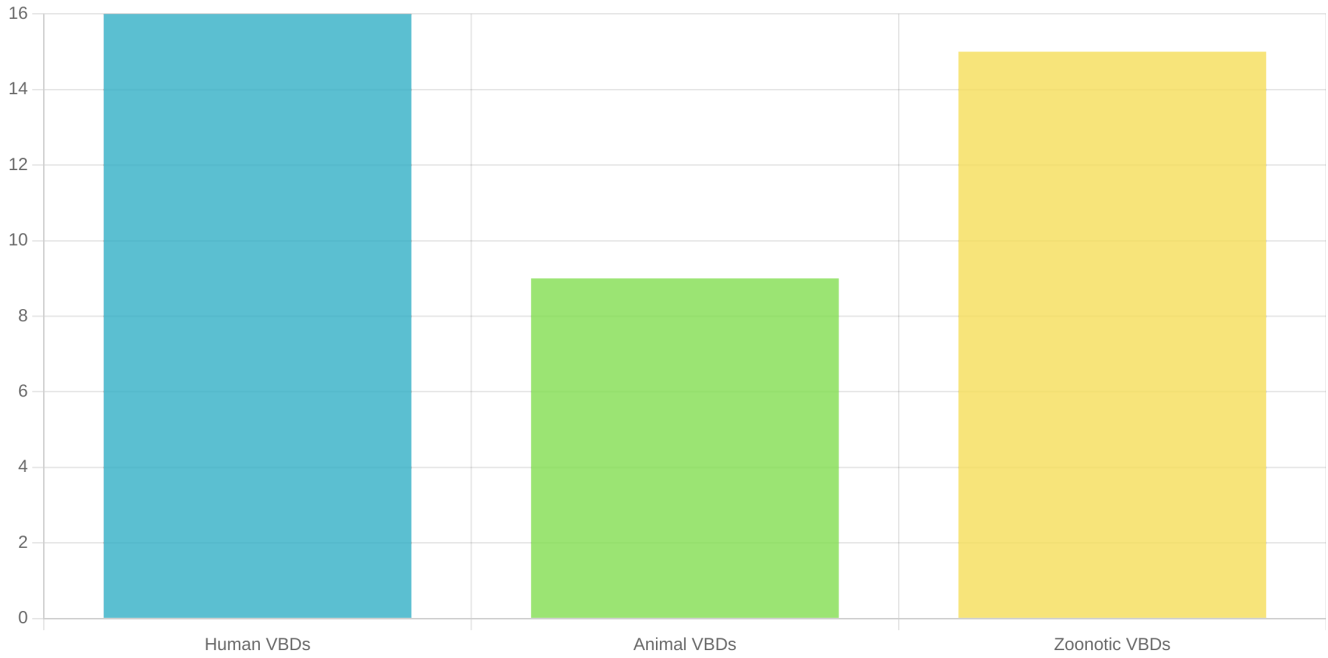


72% (18)
Yes, my research group was involved in the process of developing drugs for the treatment of PVBDs in the past

48% (12)
Yes, my research group is currently involved in the process of developing drugs for the treatment of PVBDs

(30)
Responses

5 What vector-borne diseases (VBD) are or were targeted in your research?



62% (16)
Human VBDs

35% (9)
Animal VBDs

58% (15)
Zoonotic VBDs

(40)
Responses

6 Indicate the name of the etiological agent.

Malaria / Plasmodium falciparum

Babesiosis/Babesia microti, Babesia spp.

Leishmaniasis; Leishmania infantum

Leishmaniasis/Leishmania infantum

Dr. Bohumil Sak

Malaria, plasmodium falciparum.

Leishmaniasis/ Leishmania (mainly infantum)

Leishmania infantum/Bartonella/Rickettsia conorii/Babesia/Cytauxozoon/

n/a

Leishmaniasis/Leishmania infantum; Malaria/Plasmodium falciparum; Schistosomiasis, Schistosoma mansoni

Dirofilaria immitis, Dirofilariasis, Plasmosdium, Malaria etc

Trypanosomiases (African and American), Animal trypanosomiasis, Leishmaniasis

Bunyaviridae , Hantaan viruses, HFRS

Malaria/ Plasmodium falciparum, Chagas' disease / Trypanosoma cruzi, Schistosomiasis / Schistosoma mansoni, Toxoplasmosis /Toxoplasma gondii

Leishmaniasis/Leishmania infantum

Filariasis/Dirofilaria immitis

Trypanosomiasis (African and American): Trypanosoma spp.; Leishmaniasis (Leishmania spp.); Malaria (Plasmodium spp.)

Leishmaniasis/ Leishmania spp Canine Leishmaniasis/L. infantum HAT/ T. brucei Chagas/ T. cruzi

Malaria/ Plasmodium falciparum; Lyme disease / Borrelia burgdorferi; Leishmaniasis/ Leishmania infantum

Leishmania infantum; Malaria/ Plasmodium falciparum/Trypanosoma brucei

Leishmania/Trypanosoma brucei/Trypanosoma cruzi/Plasmodium/Giardia

Borrelia spp/

Malaria/ Plasmodium falciparum

Malaria/Plasmodium falciparum

Zika infection/Zika virus Ebola virus disease/Ebola virus COVID-19/SARS-CoV-2

Leishmaniasis, trypanosmiasi (Trypansoma brucei -African sleeping sickness - and Trypanosoma cruzi - cause of Chagas' disease) caused by flebotomus, tsetse fly (Glossina spp.) and Triatominae (most importantly Triatoma infestans)

Human African Trypanosomiasis / Trypanosoma brucei, Chagas Disease/ Trypanosoma cruzi

7 What specific vectors are involved in their transmission?

Ixodes ricinus, Ixodes trianguliceps, Dermacentor verticularis

Phlebotomine sand flies of different species

Phlebotomus perniciosus

Ticks, mites (Ixodes ricinus, Dermancentor variabilis, Dermanyssus gallinae)

mosquitoes

Phlebotomus

Phlebotomus/Lutzomyia sandflies, several ticks (Rhipicephalus sanguineus, Dermacentor) and fleas

n/a

Ticks

Phlebotomus, Anopheles, Planorbidae

Aedes albopictus, Aedes caspius, Culex pipiens, Anopheles maculipennis.

Tsetse flies (Glossina), Horse flies (Tabanids), Triatoma, Sandflies (Phlebotomus)

Apodemus ag.

Anopheles gambiae (malaria), various triatomine bugs (Chagas' disease), certain types of freshwater snails such as Biomphalaria sp. (schistosomiasis)

Phlebotomus perniciosus, Ph. ariasi

All kind of Mosquitoes

Glossina spp.; Triatoma, Rhodnius, Panstrongylus spp.; Phlebotomus;Lutzomyia spp.; Anopheles spp.

Ixodes ricinus

Phlebotomus spp; Lutzimia spp

Phlebotomus/Lutzomyia/Glossina/Anopheles

ticks

Anopheles mosquitoes

Ebola - Miniopterus inflatus, M. schreibersii, fruit bats... Zika - Aedes mosquito Ae. aegypti and Ae. albopictus COVID-19 - The risk of animals spreading SARS-CoV-2 to people is low; the virus can spread from people to animals during close contact...

Leishmaniasis, trypanosmiasi (Trypansoma brucei -African sleeping sickness - and Trypanosoma cruzi - cause of Chagas’ disease) caused by flebotomus, tsetse fly (Glossina spp.) and Triatominae (most importantly Triatoma infestans)

Glossina glossinadae (tsetse fly), Triatoma infectans, Panstrongylus megistus, Rhodnius prolixus

8 In your current or past research projects on drug development for PVBDs, did you collaborate with any private or governmental institutions involved with drugs for VBDs? If yes, indicate which. If no, say no.

no

no

no

No

Companies: Intervet, Merial, Sanofi, others. Governmental institutions: University of California Sf&SD, Frauenhoffer institute Giessen, Germany

no

No

yes

NO

n/a

With private

No

No.

University of Antwerp and Institute for Tropical Diseases, Antwerp; Swiss Institute for Tropical Diseases, Basel; Jacques Perier, University of Toulouse, France,

No

yes with the Department of Medical Parasitology and Infection Biology, at the Swiss Tropical and Public Health Institute (STPH), CH-4123 Allschwil, Switzerland, or with the Laboratory of Microbiology, Parasitology and Hygiene (LMPH), Faculty of Pharmaceutical, Biomedical and Veterinary Sciences, University of Antwerp, B-2610 Antwerp, Belgium

Yes. Several companies and public instituttions.

Yes but not allowed to disclose

Yes. Swiss Tropical and Public Health Institute.

No

No

yes. FATRO.

Yes

no

Yes, the Walter Reed Army Institute of Research (WRAIR) and Institute for Medical Research-University of Belgrade

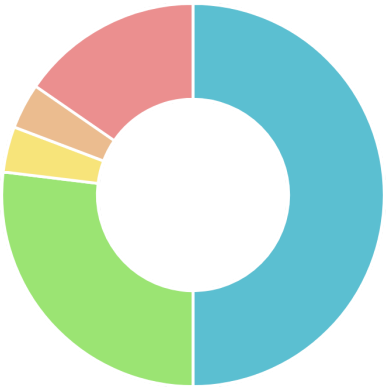
University of Granada, Spain (Prof. Luisa Carlota Lopez-Cara)

No.

yes, Glaxo Wellcome, TresCantos, Hypha uk, Tydock Pharma

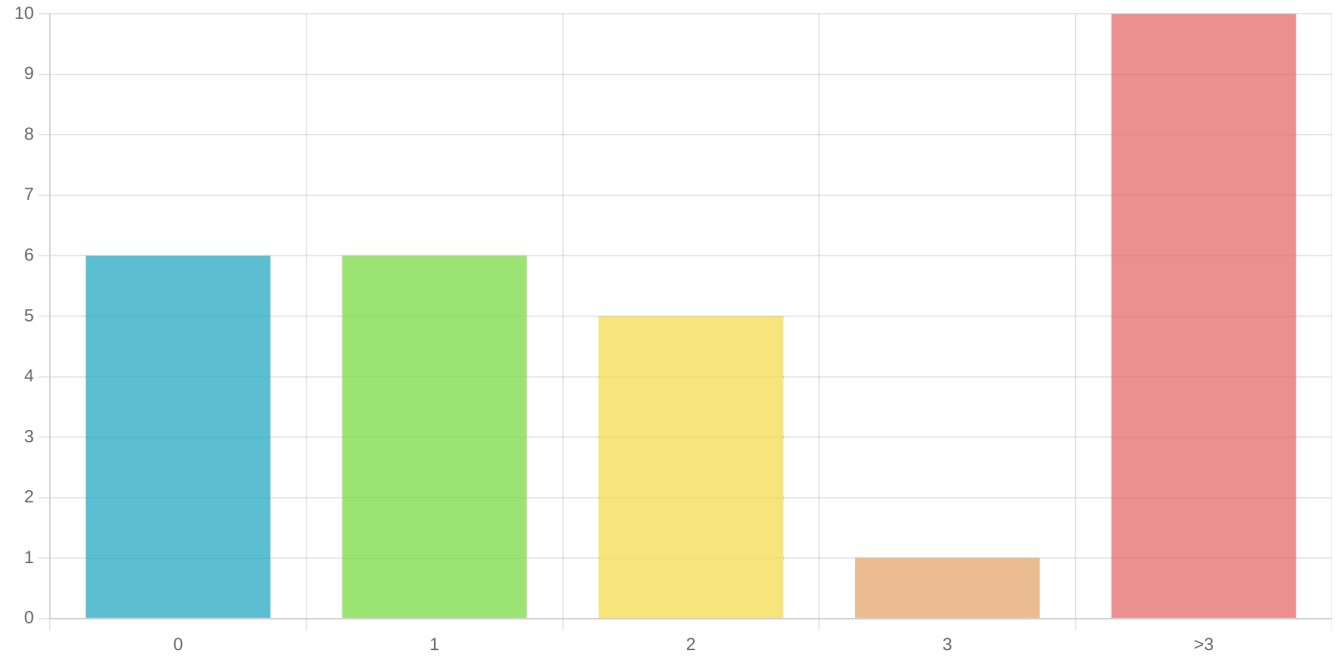
London School of Hygiene and Tropical Medicine, UK

9 How many researchers are or were involved in projects for drug development for PVBDs in your research group?



50% (13) 1-4	27% (7) 4-8
4% (1) 8-12	4% (1) 12-16
15% (4) > 16	
(4.49) Standard Deviation	(26) Responses

10 How many Bachelor and/or Master degree students are/ were involved in drug development for PVBDs in your research group?



21% (6)
0

21% (6)
1

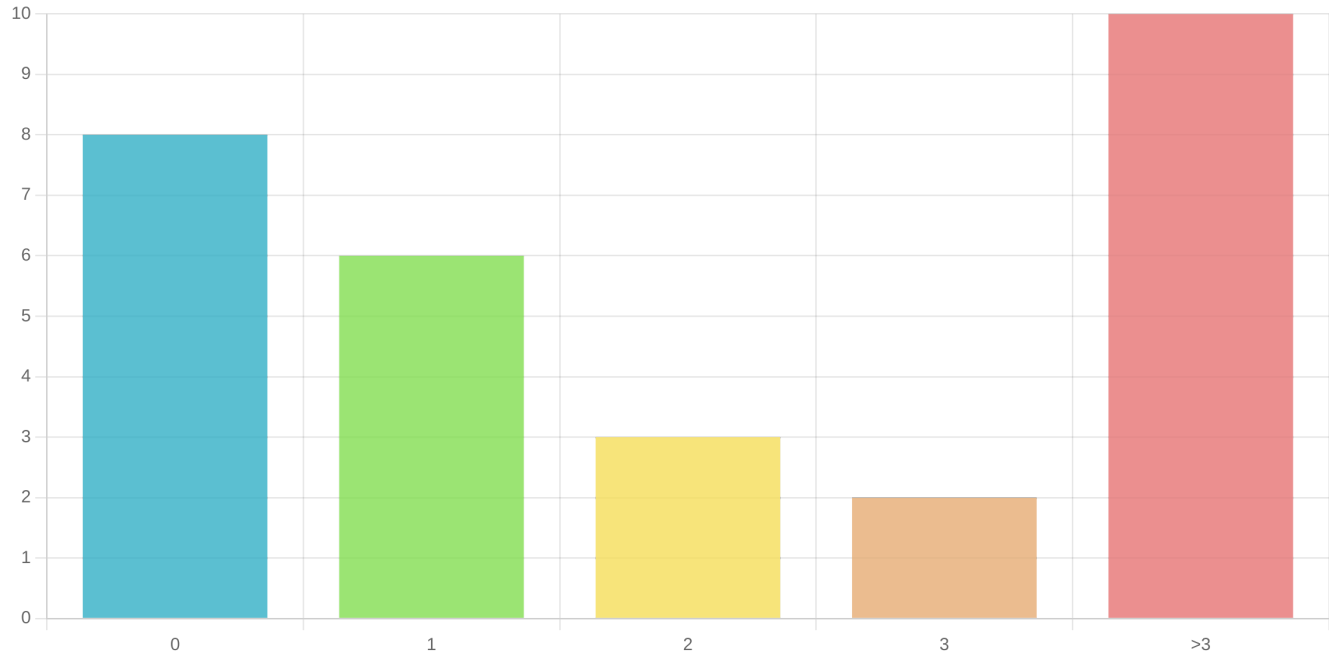
18% (5)
2

4% (1)
3

36% (10)
>3

(28)
Responses

11 How many PhD students are/ were involved in drug development for PVBDs in your research group?



29% (8)
0

21% (6)
1

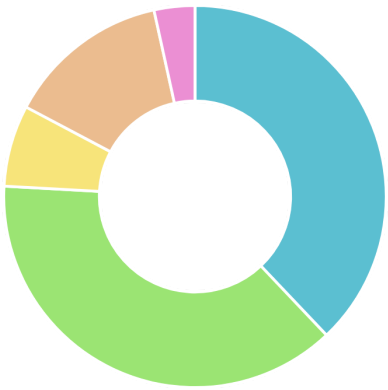
11% (3)
2

7% (2)
3

36% (10)
>3

(29)
Responses

12 What is the average age of people working in your research group?



38% (11)
<30

38% (11)
30-35

7% (2)
35-40

14% (4)
40-45

0%
45-50

3% (1)
50-55

0%
55-60

0%
60-65

0%
>65

(4.34)
Standard Deviation

(29)
Responses

13 In your current or past research projects on drug development for PVBDs, are/ were researchers natural from non-European countries involved?

54% (14)
Yes

46% (12)
No

(1)
Standard Deviation

(26)
Responses

14 f your answer to question 13 was yes, please indicate the country of origin of the non-European researchers.

Israel

Ghana, Mexico, Brazil, Columbia

Brazil;

India

Argentina, Brasil, Peru, Mexico, Venezuela, USA, Canada, Nigeria, Senegal, Marocco, India, Iracq,

India

China

Brasil, USA, UK

Brasil, Colombia, Nigeria, Kenya, Sudan (only PhD students who spent their full PhD time in my group; there were others as guests).

Brasil

Sudan

Brazil

India

Egypt

Iran

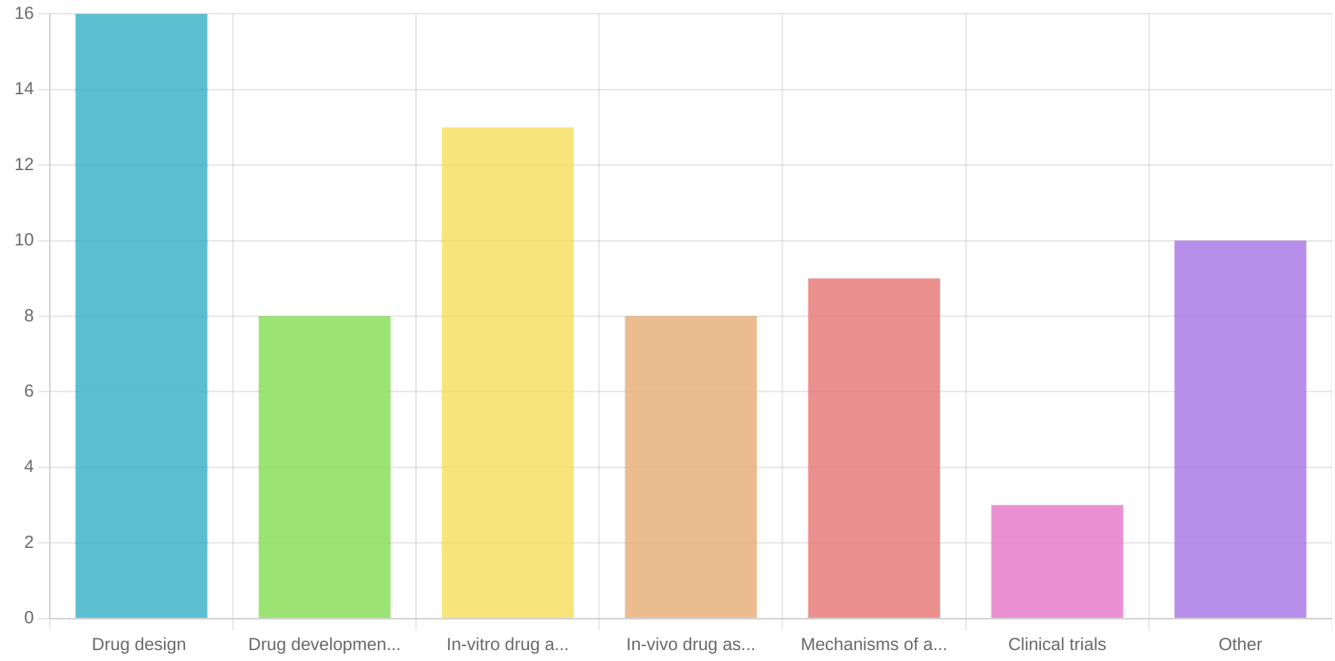
Bangladesh

India

Cameroon

Poland

15 What are the areas of expertise in drug development for VBDs included in your research group?



57% (16)
Drug design

29% (8)
Drug development

46% (13)
In-vitro drug assays

29% (8)
In-vivo drug assays

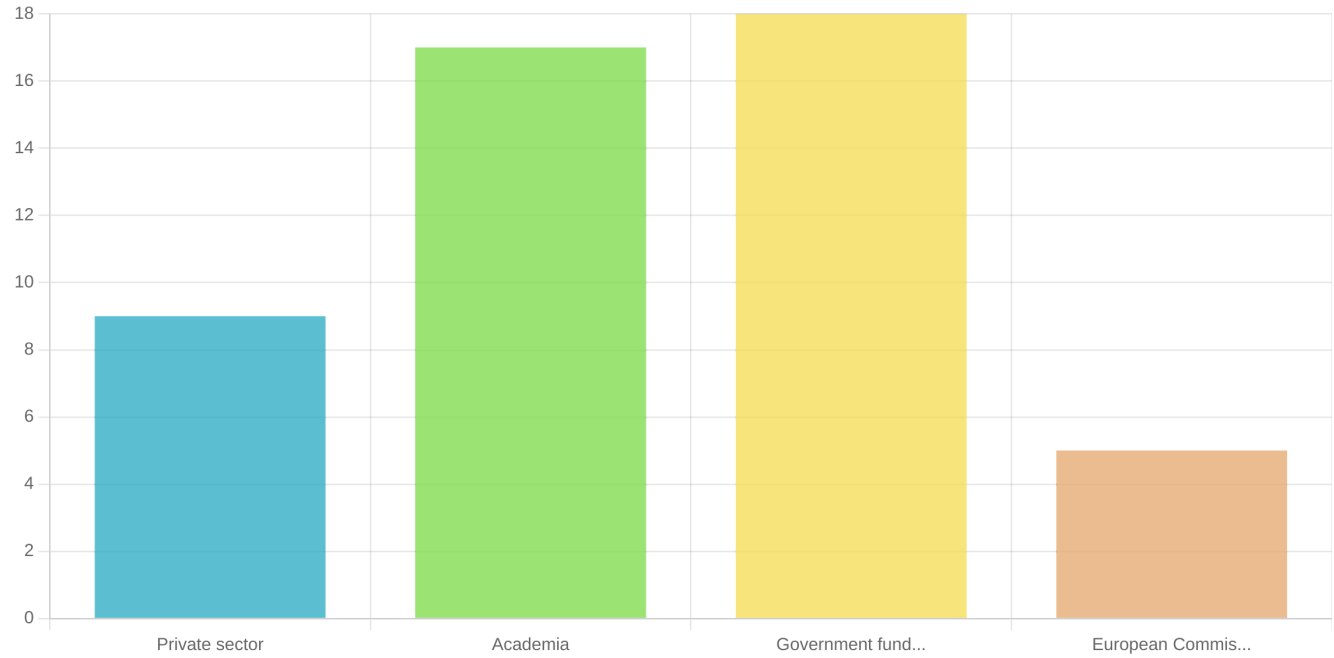
32% (9)
Mechanisms of action/ resistance studies

11% (3)
Clinical trials

36% (10)
Other

(67)
Responses

16 Who supported or supports your research on drug development for VBDs?



32% (9)
Private sector

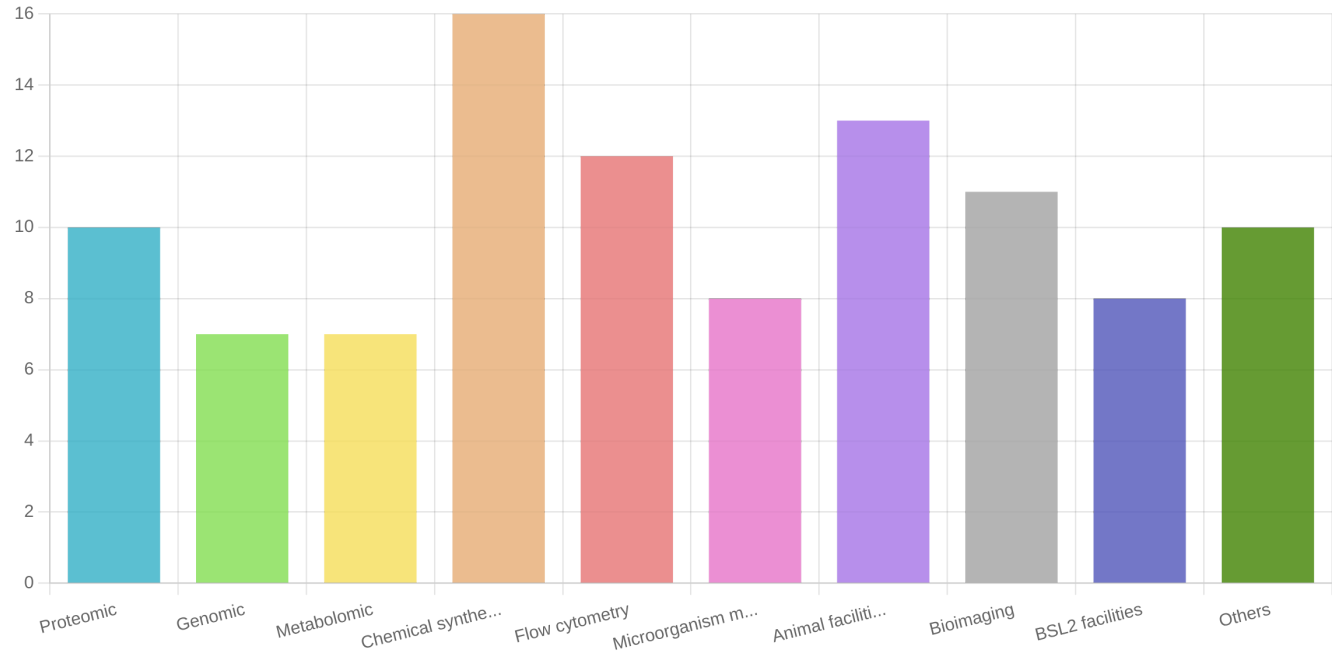
61% (17)
Academia

64% (18)
Government funds for research

18% (5)
European Commission

(49)
Responses

17 Identify which technologies/ facilities are available in your institution to support your research work on drug development for PVBDS.



36% (10)
Proteomic

25% (7)
Genomic

25% (7)
Metabolomic

57% (16)
Chemical synthesis

43% (12)
Flow cytometry

29% (8)
Microorganism manipulation facilities

46% (13)
Animal facilities

39% (11)
Bioimaging

29% (8)
BSL2 facilities

36% (10)
Others

(102)
Responses

18 If your answer to question 17 was "Other", please describe

GC-MS, LC-MS-TOF, ICP-MS

Molecular modeling

Parasite detection in mosquito vectors

Biochemistry, metabolism

physicochemistry

enzymology

Natural Products Isolation and Structure Elucidation; computational chemistry; All others mentioned are available "at my institution" (which is a rather big university), however not in my group. Therefore I only checked those directly available to my group.

In Silico Drug Deaign

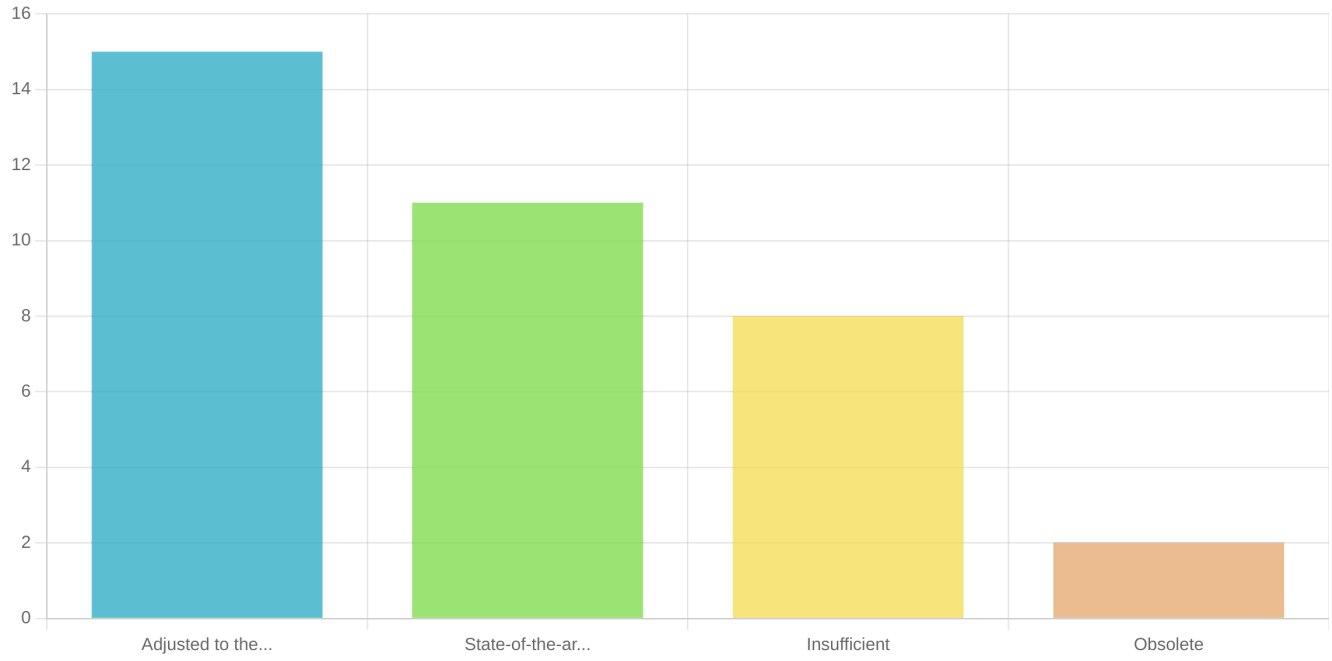
Insect rearing and infection facilities

molecular modeling, structure-based drug design

Enzyme/protein purification and characterization, enzymology

binding experiments, Mass Spectrometry, Spectroscopy based experiments

19 How do you describe the equipment and material resources available for your research on drug development for PVBDs?



54% (15)
Adjusted to the needs of my research

39% (11)
State-of-the-art

29% (8)
Insufficient

7% (2)
Obsolete

(36)
Responses

20 In the process of drug development for the treatment of VBDs, does your research contemplate strategies to reduce plastic use?

29% (8)
Yes

71% (20)
No

(6)
Standard Deviation

(28)
Responses

21 If your answer to question 20 was yes, please name up to 3 examples

recycling

we use glasswares

We are not using plastic a lot. Most of our work uses glassware anyway.

Glass pipettes

Glass TLC plates

Glass test tubes

we use reusable glassware

make active choice and awarness of not overusing plastic one use equipment

solvents re-cycling

plastics cleaning and re-use when enzyme kinetics is performed

glass cuvettes for spectroscopic studies

22 In the process of drug development for the treatment of VBDs, does your research contemplate strategies to reduce energy consumption?

35% (9) Yes	65% (17) No
(4) Standard Deviation	(26) Responses

23 If your answer to question 22 was yes, please name up to 3 examples

moving production closer to areas where it is needed

Experimenting with micro-wave assisted synthesis

water-free refrigerants for chemistry

solvent recycling

development of reactions at room temperature or with light energy

We are currently reducing energy consumption in all aspects of daily life and work. This includes, e.g., leaving digestories in standby mode if they are not used, not turning on electric devices unnecessarily, keeping a maximum of 19°C in all rooms.

Multicomponent reactions

Microwave-assisted synthesis

Ultrasound-assisted synthesis

microwave-assisted organic synthesis (MAOS)

Limit unnecessary illumination outside the normal working hours

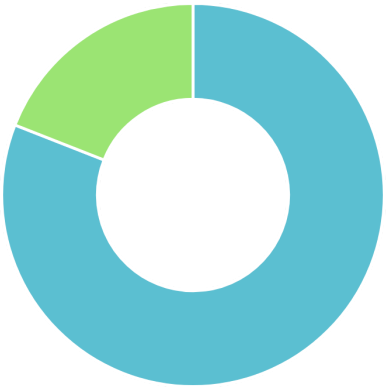
Limit unnecessary heating outside the normal working hours

instruments with low energy consumption

new building with advanced energy saving systems

lights with-off when the room is not used

24 If your answer to questions 20 and 22 was NO, do you find these measures important?



81% (17)
Yes

19% (4)
No

(6.5)
Standard Deviation

(21)
Responses

25 If your research contemplates the use of laboratory animals and in vivo testing, does it incorporate strategies to reduce their use?

75% (18)
Yes

25% (6)
No

(6)
Standard Deviation

(24)
Responses

26 In the process of drug development for the treatment of VBDs, does your research contemplate aspects of the new compound's biodegradability?

33% (9)
Yes

67% (18)
No

(4.5)
Standard Deviation

(27)
Responses

27 If your answer to question 26 was YES, please name up to 3 examples

plant derived compounds

developement of in vitro feeding to whoile tick lifecycle

reducing the number of used animals by strategy omtimization

Biodegrability is of concern by our collaborators from private sfera, but certainly becomes an important aspects nnext to drug safety

selection of biocompatible components

Introduction of functional groups leading to biodegradation

Prediction of biodegradability in silico and use of this information to prioritize target compounds

identification of drug metabolites under biomimetic conditions

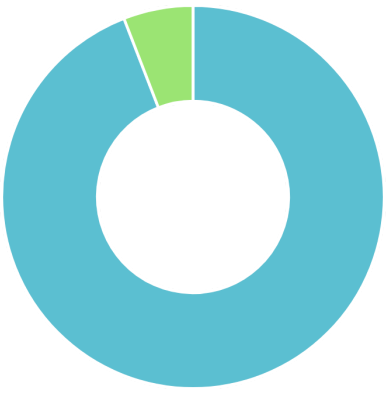
We are sending only compounds to in vivo tests that show very promising in vitro activity.

We are working with compounds that were synthesized by living organisms. Such compounds are generally more easily biodegradable than most synthetic compounds. Especially, our compounds do not contain any halogen and can be expected to be degraded solely to CO2, water, (sometimes ammonia, if they contain nitrogen).

In vitro ADMET studies

think ofit during drug desing

28 If your answer to question 27 was NO, do you think it should?



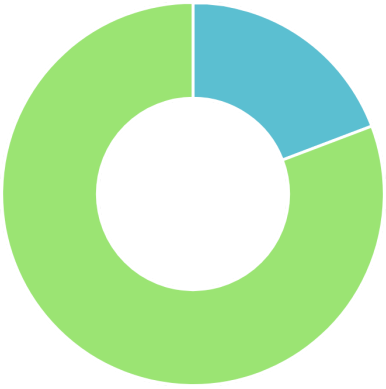
94% (16)
Yes

6% (1)
No

(7.5)
Standard Deviation

(17)
Responses

29 In the process of drug development for the treatment of VBDs, does your research contemplate aspects of the new compound's ecotoxicology?



19% (5) Yes	81% (21) No
(8) Standard Deviation	(26) Responses

30 If your answer to question 29 was YES, please name up to 3 examples (E.g. ecotoxicity to aquatic organisms; ecotoxicity to organisms in the soil; presence of toxic residues in edible products (meat/eggs/vegetables) or drinking water.

same as previous

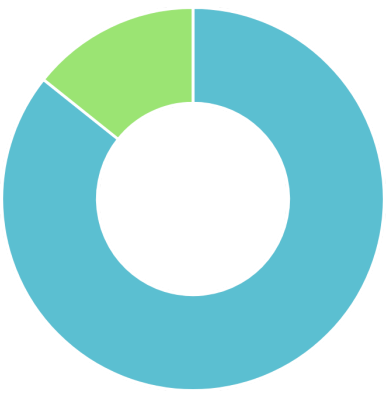
Until very recently, we did not explicitly take this into account; however, it is an important aspect that will be more in our focus in the future.

Ecotoxicity to C. elegans

Tests against free living protists are being adopted

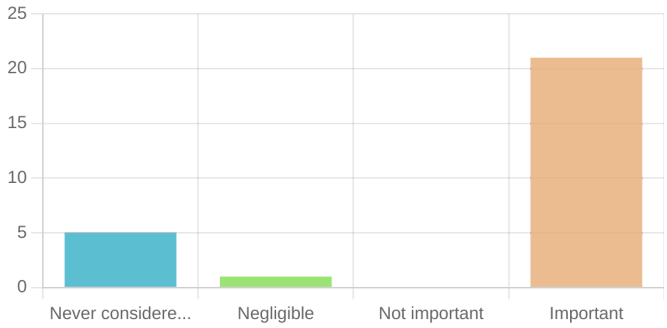
testing on mammalian cells

31 If your answer to question 29 was NO, do you think it should?



86% (18) Yes	14% (3) No
(7.5) Standard Deviation	(21) Responses

32 Define the importance of ecotoxicological studies in the process of drug development for PVBDS



19% (5)
Never considered aspects of ecotoxicology in this process

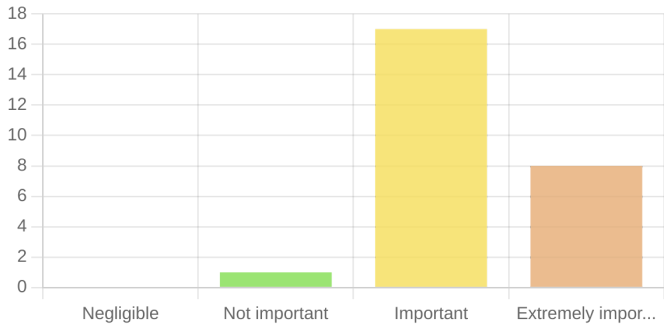
4% (1)
Negligible

0%
Not important

78% (21)
Important

(27)
Responses

33 Define the importance of incorporation of ecotoxicity studies in the marketing authorization for drugs against PVBDS



0%
Negligible

4% (1)
Not important

65% (17)
Important

31% (8)
Extremely important

(26)
Responses