

Applicant: **Heinrich, Michael**
Organisation: **University College London**
Funding Sought: **£20,100.00**
Funding Awarded: **£20,100.00**

DIR26FW\1018

DARFW051 Abdellah Agrhraz

The Fellow will acquire (1) ethnopharmacological concepts and techniques, applied specifically to a vulnerable endemic medicinal plant (*Anacyclus pyrethrum*), expanding his capacity to support the conservation and sustainable commercialisation of Moroccan useful plants; (2) an understanding of how to improve indigenous participation in the CBD's ABS mechanisms, applicable to Morocco.

Section 1 - Contact Details

PRIMARY APPLICANT DETAILS

Title Prof
Name Michael
Surname Heinrich
Organisation University College London
Tel (Work)
Email (Work)
Address

GMS ORGANISATION

Type	Organisation
Name	University College London
Phone (Work)	
Email (Work)	
Address	

Section 2 - Title, Dates & Budget Summary

Q3. Name and official address of proposed Darwin Fellow

(include email address). Please include a one page CV with the package of CVs for Q7.

Name	Abdellah Agrhraz
Address	Global Diversity Foundation
Email Address	

Q4. Summary of proposed Fellowship i.e. Outcome

The Fellow will acquire (1) ethnopharmacological concepts and techniques, applied specifically to a vulnerable endemic medicinal plant (*Anacyclus pyrethrum*), expanding his capacity to support the conservation and sustainable commercialisation of Moroccan useful plants; (2) an understanding of how to improve indigenous participation in the CBD's ABS mechanisms, applicable to Morocco.

Q5. Project dates

Start date:

01 October 2020

End date:

30 September 2021

Duration (e.g. 1 year, 2 months):

1 year

Q6. Budget summary

	2020/2021	2021/2022	Total
(Apr - Mar) £			20,100.00

Section 3 - Principals

Q7. Principals in the Project

Please give the details of the individuals from the Lead Organisation (and other institutions if relevant) who would be directly involved in supervising/working with the Darwin Fellow. Please provide a one page CV for each of these named individuals and remember to include the Fellow's CV in the pdf. You may copy and paste this table if you need to provide details of more individuals.

Details	Project Leader	Other Expert	Other Expert	Other Expert
Surname	HEINRICH	MARTIN	BABAHMAD	Scotti
Forenames(s)	Michael	Gary	Rachit A	Francesca
Post held	Prof & Head of Centre	Chair	Field Scientist	Postdoctoral researcher

Organisation

Telephone/Skype


Email

Do you require more fields?

Yes

Details	Other Expert	Other Expert	Other Expert
Surname	MARKOUK	<i>No Response</i>	<i>No Response</i>
Forenames(s)	Mohammed	<i>No Response</i>	<i>No Response</i>
Post held	Professor	<i>No Response</i>	<i>No Response</i>
Organisation		<i>No Response</i>	<i>No Response</i>
Telephone/Skype		<i>No Response</i>	<i>No Response</i>
Email		<i>No Response</i>	<i>No Response</i>

Please provide a one page CV for each of these named individuals, including the Fellow named at Q3, uploaded as one PDF.

 [CVs-ALL-Darwin-10-19](#)

 01/11/2019

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 pdf 551.27 KB

Section 4 - Aims, Activities & Achievements

Q8. Describe briefly the aims, activities and achievements of the Lead Organisation

(Large organisations please note this should describe your unit or department)

The Pharmacognosy and Phytotherapy Research Group in the UCL School of Pharmacy conducts research with a transdisciplinary perspective integrating approaches from the natural and social sciences. Its overall aim is to tackle fast changing global health needs by focusing on the use of plant derived products such as herbal remedies, health foods, nutraceuticals and botanicals. It integrates methodological approaches from ethnopharmacology, medicinal plant research, pharmacy practice, and anthropology. Specific scientific interests include bioactive natural products, pharmacognosy and ethnobotany. Areas of specialisation include metabolomic approaches in medicinal plant research, anti-inflammatory and anti-oxidant natural products relevant to transcription factor NF- κ B and its pathway as molecular targets of natural product research, quality and safety of herbal medical products, and herbal medicine intervention studies. Its sociocultural approach emphasizes food and medicinal plant use in the Mediterranean, medicinal plant use history in Europe, and value and supply chain of medicinal plants.

Q9. Describe briefly the aims, activities and achievements of the proposed Darwin Fellow's employing organisation.

(Large organisations please note this should describe your unit or department)

Global Diversity Foundation (UK) supports the resilience and wellbeing of local communities in the face of

environmental and social change. It promotes agricultural, biological and cultural diversity around the world through research, training and practical action. Since 2002, GDF has developed a Mediterranean regional programme currently focused on Morocco. Activities in the region include a MAVA Foundation-funded grant for an Integrated Approach to Plant Conservation in the Moroccan High Atlas and two Darwin Initiative projects, one on “Medicinal root trade, plant conservation and local livelihoods in Morocco” (2014-2017) and the other on “Mobilising useful plant conservation to enhance Atlas mountain community livelihoods” (2017-2020). During the first Darwin Initiative grant, GDF sponsored the creation of the Moroccan Biodiversity and Livelihoods Association, of which Abdellah Aghraz is Treasurer. MBLA implements integrated in-situ and ex-situ conservation measures and strengthens cultural practices of conservation to protect biodiversity and enhance local livelihoods.

Q10. Describe briefly the proposed Fellow’s current role within their organisation and their link to a Darwin project (if applicable), including the project reference number, his/her role in that project and any ongoing involvement.


If the Fellow has no link to a Darwin project please discuss their involvement in implementing the biodiversity conventions, treaties and agreements supported by the Darwin Initiative.


Abdellah Aghraz is the Morocco Field and Laboratory Scientist in GDF’s Mediterranean programme, co-funded by Darwin project 24-010: Mobilising useful plant conservation to enhance Atlas mountain community livelihoods, which ends in March 2020. He is responsible for Oukaimeden, one of three field sites in the High Atlas mountains where GDF is engaged with agroecology, biodiversity conservation, cultural landscapes and resilient livelihoods. In his fieldwork, he documents plant ecology and use, while implementing biodiversity conservation actions, including the establishment of a community-based plant nursery and replanting of degraded areas. As part of this programme, Abdellah continues his association with the Phytochemistry and Pharmacology of Medicinal Plants Unit of the Laboratory of Biotechnology, Protection and Valorization of Plant Resources in the Faculty of Sciences Semlalia, Cadi Ayyad University. The laboratory provides the facilities and supervision to continue phytochemical and ethnopharmacological analysis – including assessment of the biological activities of various essential oils and plant extracts – of Moroccan plants that are economically important, endemic and endangered. In particular, Abdellah is developing protocols for organoleptic and laboratory analysis of plant quality and chemical characterisation of local chemotypes and varieties, based on essential oil composition and other factors.

Please provide a combined PDF of all Letters of Support.

 [Letters of support combined11-19](#)

 01/11/2019

 09:28:54

 pdf 776.97 KB

Section 5 - Outcomes & Objectives

Q11. Provide a concept note for the Darwin Fellowship. This should include:

Q11a. A clear outline of the aim and objectives of the Fellowship, and an indication of how the achievement will be measured

This fellowship will provide Abdellah Aghraz a one-year post-doctoral opportunity to acquire new ethnopharmacological concepts and laboratory techniques that will contribute significantly to his research career dedicated to Moroccan useful plants. The project will focus on the Atlas daisy (*Anacyclus pyrethrum*) – also called akarkara, pellitory and Spanish chamomile – an endemic flagship species native to Morocco, Algeria and Spain that is intensively harvested in North Africa and commercialised across the Middle East and South Asia. The species, categorized as vulnerable globally in the IUCN Red List, is reputed for its content of N-alkylamides, with the pungent pellitorine as main constituent, and a range of essential oils that have led to its use as an aphrodisiac and toothache and facial neuralgia remedy. Previous research conducted in collaboration with Global Diversity Foundation has documented frequent adulteration and substitution in Atlas daisy samples commercialised in Morocco and abroad. Abdellah will develop specific methods for the phytochemical evaluation routing of *A. pyrethrum*, contributing to an understanding of how chemotypic variation affects its harvesting and commercialisation, which is intrinsically linked to its conservation and the livelihoods derived from its production and sale. After gaining an understanding of Atlas daisy chemotypes, Abdellah will document how they move through market value chains across zones of harvest and commercialisation. An exchange with the Center for Middle Eastern Plants of Royal Botanic Garden Edinburgh and the Economic Botany Collection at Kew is planned (but depends on the exact schedule) enriching current programmes on sustainable and equitable use of plant resources in Morocco. Abdellah would be expected to publish two research papers in peer-reviewed journals with the project leader and others experts. In addition, he would ensure broad dissemination of this approach in Morocco by delivering at least 3 conference papers, seminars or workshops at academic institutions in Morocco.

Q11b. The role of the Lead Organisation, and others where relevant

The UCL Pharmacognosy and Phytotherapy Research Group will host the Darwin Fellow for two post-doctoral research periods, an initial stay of 6 months and – after four months of Darwin Initiative supported field and laboratory work in Morocco – a final 2-month visit in 2021. Under the supervision of Michael Heinrich and his colleagues, Abdellah Aghraz will assess the chemical composition of Algerian and Moroccan field collections and market samples of pellitory through nuclear magnetic resonance based metabolomics profiling combined with standard methods used in industrial quality control such as high performance thin layer chromatography (HPTLC), and if applicable liquid chromatography–mass spectrometry (LC-MS) and high performance liquid chromatography (HPLC). This approach combines conventional methods easily replicated in Morocco with unique approaches developed by the UCL Pharmacognosy and Phytotherapy Research Group and successfully used to conduct a rapid and robust assessment of complex mixtures. In addition, Abdellah will participate in seminars on indigenous peoples' role in the Convention on Biological Diversity's Access and Benefit Sharing mechanisms, the focus of a Darwin Initiative project led by the UCL School of Pharmacy, and explore how lessons learned from other countries can be applied in Morocco. Prof Heinrich and one of his colleagues will visit Marrakech and the High Atlas in Spring 2021, when Abdellah returns for field and laboratory work, to explore further collaboration with Cadi Ayyad University's Phytochemistry and Pharmacology of Medicinal Plants Unit and other institutions. The Centre for Middle Eastern Plants of the Royal Botanic Garden Edinburgh will host Abdellah for a week during his first stay in the UK, allowing him to learn about its evolutionary conservation approach and its relevance to GDF's work in Morocco, especially how to assess and conserve the evolutionary uniqueness of the flora, linked to an understanding of medicinal and aromatic plant chemotype distribution.

Section 6 - Legacy & Collaboration

Q12. Legacy

Provide information on how the Darwin Fellow will utilise, promote and disseminate the benefits of the Fellowship on return to his/her home country. Will a strategy be developed during the Fellowship to ensure this is achieved?

During the Fellowship, Abdellah will develop a strategy to share the ethnopharmacological concepts and techniques – as well as insights on access and benefit sharing and evolutionary conservation – with colleagues and institutions in Morocco. He will coordinate a research visit of UCL School of Pharmacy colleagues to Marrakech. Upon finishing the Darwin Fellowship, he will replicate the laboratory methodology he develops with the UCL Pharmacognosy and Phytotherapy Research Group in the Phytochemistry and Pharmacology of Medicinal Plants Unit of Cadi Ayyad University (esp. HPTLC), where he will explain his approach to colleagues and students. His results will help guide the work of the Moroccan Biodiversity and Livelihoods Association, which is engaged in community-based plant conservation, including cultivation and distribution of useful plants such as pellitory. Abdellah's case study on *Anacyclus pyrethrum* will inform implementation of a relatively new Moroccan law (29-05) on the protection of wild species of flora and fauna and control of their commercialisation, which is enforced by the Moroccan High Commission for Water and Forests and Desertification, a partner in GDF's current Darwin Initiative grant. More generally, he will disseminate the outcomes of his postdoctoral research in national conferences, seminars and workshops.

Q13. How will the Fellowship assist the Fellow's organisation and/or local communities and/or home country in working towards the objectives (or implementation) of the Conventions, Treaties and Agreements supported by the Darwin Initiative?

Please refer to specific Articles or cross cutting themes as appropriate.

Addressing Darwin Initiative priorities regarding the Nagoya Protocol strategic framework for capacity building and development (cf. Learning Note), this Fellowship would assist Morocco to 'develop endogenous research capabilities to add value to [its] own genetic resources and traditional knowledge' (NP art.22.4.d) by working with local partners to determine the conservation status, phytochemical attributes and ethnobotanical knowledge of a key plant genetic resource, and disseminating co-produced knowledge and information on the value and potential of genetic resources and traditional knowledge to enhance local Moroccan economies and wellbeing. The project addresses important areas of convergence of Target 9 and 13 of the CBD Global Strategy for Plant Conservation (GSPC), 'Aichi' Target 13 and ITPGRFA Article 5d and 6e, which use similar language to call for (a) promoting in situ and ex situ conservation and sustainable use of the genetic diversity of crops, wild relatives and other socio-economically and culturally valuable plant species while (b) respecting, preserving and maintaining associated indigenous and local knowledge to (c) support customary use, sustainable livelihoods, local food security and health care. In addition, the project is linked to sustainable development goals (1) no poverty, (3) good health, (4) quality education and (15) life on land.

Q14. What collaboration has there been with the Darwin Fellow to date in developing the proposal, and what collaboration is planned for the duration of the Fellowship?

Where relevant, describe any consultation or collaboration by the proposed Fellow within his/her own country.

Michael Heinrich and Gary Martin have had links for many years and have collaborated in organising meetings of learned societies and workshops, for example in collaboration with the Uni. Kent. To develop this proposal, Abdellah Aghraz, Michael Heinrich and Gary Martin have worked together closely through

face-to-face and Skype meetings, as well as extensive exchange of emails. Abdellah has gained written approval for the project from the Moroccan Biodiversity and Livelihoods Association and the Phytochemistry and Pharmacology of Medicinal Plants Unit of the Laboratory of Biotechnology, Protection, and Valorization of Plant Resources Faculty of Science, Cadi Ayyad University, confirming their commitment to the project. Michael Heinrich, Francesca Scotti (Darwin co-funded postdoc) and selected colleagues at the UCL School of Pharmacy will supervise Abdellah during the months he is in London, and Sophie Neale and colleagues will guide his exploration of evolutionary conservation in Edinburgh. Gary Martin, Mohammed Markouk and Rachid Ait Babahmad will supervise field and laboratory research in Morocco. The fellow will benefit from the experiences with an ongoing Darwin project led by Michael Heinrich (26-005 Green Health: improving indigenous participation through the CBD's ABS) especially as it relates to the implementing A&B mechanisms in different countries.

Q15. Where will the Darwin Fellow be based?

Please be specific with organisational details and dates (where more than one location).

1 October 2020 to 31 March 2021: Abdellah would be in residence in the UCL School of Pharmacy in London, embedded in the Pharmacognosy and Phytotherapy Research Group, to learn new conceptual frameworks and acquire novel techniques in ethnopharmacology; during this period he would visit the Center for Middle Eastern Plants of the Royal Botanic Garden Edinburgh.

1 April to 31 July 2021: he would return to Morocco for six months of Darwin Initiative-supported field and laboratory research on peltitory with the support of Global Diversity Foundation and Faculty of Sciences, Cadi Ayyad University, where he would be embedded in the Phytochemistry and Pharmacology of Medicinal Plants Unit of the Laboratory of Biotechnology, Protection, and Valorization of Plant Resources;

1 August to 30 September 2021: he would then spend a final two months conducting laboratory research on collected peltitory roots, using the new analytical techniques and conceptual frameworks he has acquired

From 1 October 2021, after Darwin support has ended, he will transfer concepts and techniques to colleagues and student of the Faculty of Sciences, Cadi Ayyad University.





Section 7 - Programme of Work & Funding

Q16. Provide a programme of work, including key milestones, through the duration of the Fellowship

Please complete the Excel spreadsheet linked below to describe the intended workplan for your project.

[Fellowship Implementation Timetable Template](#)

For each activity (add/remove rows as appropriate) indicate the number of months it will last, and shade only the months in which an activity will be carried out. The workplan can span multiple pages if necessary.

-
-  [R26 Fellowship - Implementation Timetable](#)
[UCL Heinrich](#)
 -  31/10/2019
 -  20:04:08
 -  xlsx 14.52 KB

Q17. Costs

Using UK Government Financial Years (April 2020 – March 2021), please complete your budget using the template provided here and upload below.

[Fellowship Budget Template](#)

Please note, this should not be presented as academic years.

-
-  [Darwin R26 fellowship application UCL-Heinrich Budget](#)
 -  31/10/2019
 -  13:49:24
 -  xls 66.5 KB

Q18. Other Sources of funding: provide details and amounts

Date applied for	Donor Organisation	Amount (include currency)	Comments (including confirmed/unconfirmed)
01 November 2019	Global Diversity Foundation		GDF will provide co-funding for consumables for laboratory and field research during the postdoctoral period
<i>No Response</i>	European Cooperation in Science and Technology (COST) project CA18201 - An integrated approach to conservation of threatened plants for the 21st Century		This approved new research network will begin funding of young field scientists in March 2020; Abdellah will apply for support for field research on Anacyclus pyrethrum
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>	<i>No Response</i>
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>	<i>No Response</i>

Q19. FCO Notification

Please check the box if you think that there are sensitivities that the Foreign and Commonwealth Office will need to be aware of should they want to publicise details of the Darwin Fellowship and the resultant work in the UK or the Darwin Fellow's home country.

Unchecked

Please comment on whether you require a visa to undertake this Fellowship. If you require a visa, do you foresee any difficulty in being granted a visa?

Yes a visa will be required, but the candidate has already travelled for research visits to Italy and Portugal under the EU Erasmus programme, and should not have any difficulty obtaining a visa to the UK for this fellowship.

Section 8 - Certification

Q20. Certification

On behalf of the

Company

of

UCL School of Pharmacy

I apply for a grant of


£20,100.00

I certify that, to the best of our knowledge and belief, the statements made by us in this application are true and the information provided is correct. I am aware that this application form will form the basis of the project schedule should this application be successful.

(This form should be signed by an individual authorised by the applicant institution to submit applications and sign contracts on their behalf.)

- I enclose one page CVs for project principals and letters of support as requested in the Guidance.

Checked

Name	Michael Heinrich
Position in Organisation	Prof. & Head of Centre
Signed	 Signature-single  01/11/2019  11:38:12  pdf 102.48 KB
Dated	01 November 2019

Section 9 - Submission Checklist

I have read the Guidance.	Checked
I have read, and can meet, the current Terms and Conditions for this fund.	Checked
I have provided actual start and end dates for the Fellowship.	Checked
I have provided my budget based on UK government financial years i.e. 1 April - 31 March.	Checked
I have checked that my budget is complete, correctly adds up and that I have included the correct final total in the application.	Checked
The application been signed by a suitably authorised individual (clear electronic or scanned signatures are acceptable).	Checked
I have included a 1 page CV for the proposed Fellow and the experts listed in Question 7.	Checked
I have provided the relevant letters of support.	Checked
I have checked the Darwin website immediately prior to submission to ensure there are no late updates.	Checked
I have read and understood the Privacy Notice on GOV.UK.	Checked

We would like to keep in touch!

Please check this box if you would be happy for the lead applicant (Flexi-Grant Account Holder) and project leader (if different) to be added to our mailing list. Through our mailing list we share updates on upcoming and current application rounds under the Darwin Initiative and our sister grant scheme, the IWT Challenge Fund. We also provide occasional updates on other UK Government activities related to biodiversity conservation and share our quarterly project newsletter. You are free to unsubscribe at any time.

Unchecked

Data protection and use of personal data

Information supplied in this application form, including personal data, will be used by Defra as set out in the latest copy of the Privacy Notice for Darwin, Darwin Plus and the Illegal Wildlife Trade Challenge Fund available [here](#). This Privacy Notice must be provided to all individuals whose personal data is supplied in the application form. Some information, but not personal data, may be used when publicising the Darwin Initiative including project details (usually title, lead organization, location, and total grant value) on the GOV.UK and other websites. Information relating to the project or its results may also be released on request, including under the 2004 Environmental Information Regulations and the Freedom of Information Act 2000. However, Defra will not permit any unwarranted breach of confidentiality nor will we act in contravention of our obligations under the General Data Protection Regulation (Regulation (EU) 2016/679).