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Thoughts and expectations of young professionals about the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM)

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Abstract

Objectives: Young laboratory medicine professionals (YLMPs) are the future of clinical laboratories. Although everyday practice shows significant differences among countries, especially during residency training, most of them face the same challenges. Besides promoting scientific, professional and clinical aspects of laboratory medicine in Europe, the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM) should take into consideration YLMPs' concerns and interests to help them achieve excellence. The aim of this survey was to assess the opinion and expectations of YLMPs about their involvement in the activities of EFLM.

Methods: An online survey was distributed to YLMPs in Europe through different channels. The questionnaire

consisted of 21 items grouped into five sections: demographic questions, opinion about the current status of YLMPs within EFLM, YLMPs network, suggestions and opportunities, and scientific training and exchange. Where appropriate, responses from residents and specialists were compared.

Results: A total of 329 valid responses were obtained from 53 different countries. Countries with the highest number of participants were Spain, Turkey, Croatia and Romania. A significant percentage would like to know more about EFLM and their activities (86%) and wish EFLM promoted networking and scientific exchanges (95%), for instance by means of a European YLMPs network (93%). EFLMLabX project was widely unknown (75%).

Conclusions: YLMPs demand better connection to share concerns about daily healthcare duties, to keep updated and to advance professionally. EFLM needs to improve their advertising through national societies to increase YLMPs' participation. In addition to international meetings and congresses, respondents have emphasized that workshops and other small group activities would significantly help promote laboratory medicine practice in Europe.

Keywords: career; professional development; scientific exchange; specialist.

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Introduction

Young laboratory medicine professionals (YLMPs) are the future of clinical laboratories [1]. According to the latest guidelines, laboratory scientists should master the different skills in clinical biochemistry, which include laboratory organization and management, analytical methodologies and pathophysiology [2]. In addition to the mentor and the colleagues, prominent figures for the guidance of a professional in their early career are the scientific societies and scientific groups.

The European Federation of Clinical Chemistry and Laboratory Medicine (EFLM) is an international

organization founded in 2007 that plays an essential role in clinical decision-making by participating in the screening, diagnosis, prognosis, treatment and follow-up of diseases. Through different committees and together with over 40 individual national societies, EFLM aims to improve patient care and outcomes by promoting scientific, professional and clinical aspects of clinical chemistry and laboratory medicine in Europe [3, 4].

The practice of clinical chemistry in Europe shows significant differences among countries, especially in the residency training level [5], although all of them face the same challenges in their professional life. Harmonizing education and training is a key point to ensure high-quality practices among Laboratory Medicine professionals [6]. Various activities (on-site and online) are arranged by EFLM in order to enhance collaboration among laboratory professionals and share experience. One of the most recent examples is the EFLM exchange project (EFLMLabX). It was launched to establish the big nets-communication between Laboratory Medicine professionals, to contribute to a better exchange of knowledge and experience and to achieve

excellence in this profession [7]. In this line, young professionals are the ones who might most benefit from such initiatives, so their participation and involvement in them are vital.

According to experts, the initial step prior implementation of new activities or initiatives is to observe the current situation by means of a survey to a representative population. The aim of this survey was to assess the opinion and expectations of YLMs about their involvement in the activities of the EFLM.

Materials and methods

An online questionnaire was prepared in English on *GoogleForms* and was distributed to European YLMs through different channels: e-mail circulation list, EFLM social networks (Facebook, LinkedIn, Twitter), and through the different national societies and representatives. Participants were also asked to forward the link to colleagues.

The online questionnaire was open from February 10th until March 15th, 2020 and included a total of 21 items (available on: <https://forms.gle/vAgvYG8wdSdwG6Yv5> and as Supplemental Material).

Table 1: Opinion about the current status of YLMs within EFLM situation section. Number of respondents for each item and percentage are presented.

Question 1: How much do you know about EFLM and its activities?						
I know nothing (1)	2	3	4	I know a lot (5)		
39 (12%)	90 (27%)	118 (36%)	64 (19%)	18 (6%)		
Question 2: What do you think about the current level of involvement of young scientists in EFLM?						
Very low	Low	Regular	High	Very high		
35 (11%)	80 (24%)	136 (41%)	61 (19%)	17 (5%)		
Question 3: What do you like about EFLM?						
						
Question 9: How do you get the news about EFLM activities?						
Through my National Society	EFLM e-mail circulation list	EuroLabNews or similar newsletter	EFLM website	LinkedIn	Other	I don't get any information
125 (38%)	96 (29%)	32 (10%)	4 (1%)	4 (1%)	15 (4%)	57 (17%)

YLMs, young laboratory medicine professionals; EFLM, European Federation of Clinical Chemistry and Laboratory Medicine.

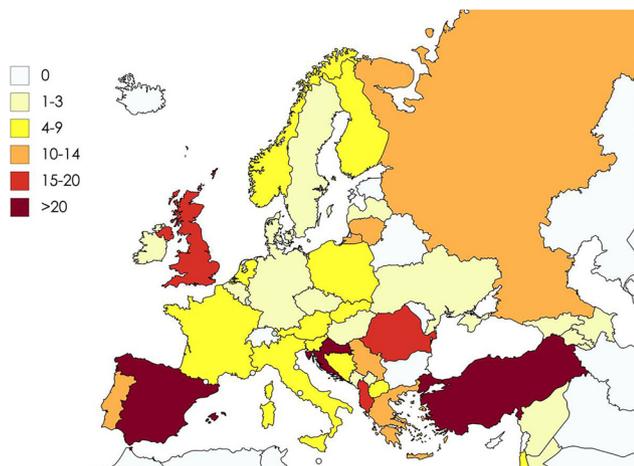


Figure 1: Number of participants in different European countries.

The questionnaire consisted five sections: demographic questions, opinion about the current status of YLMPs within EFLM, YLMPs network, suggestions and opportunities, and scientific training and exchange. Eligible were only individuals under 45 of age.

Data analysis

Data were downloaded and plotted for descriptive analysis. Quantitative data were presented as a number of respondents and percentages. Answers by specialists and residents were compared using the Chi square test or the Student's *t*-test, where appropriate. For the statements included in question 10, "Agree + Strongly Agree" responses were compared with "Disagree + Strongly disagree". Statistical significance was set at 0.05.

All statistical analyses including calculation of the mean values and standard deviations were performed using the MS Excel 2010 software (Microsoft Corporation, USA).

Results

Out of 333 responses, a total of 329 eligible responses were obtained, from 53 different countries. Three-hundred and nine of them (93.9%) were from European countries, whereas the other 20 came from outside Europe. Participation in the different countries is shown in Figure 1. The countries with the highest number of participants were Spain ($n = 55$), Turkey ($n = 26$), Croatia ($n = 22$) and Romania ($n = 19$). The mean age of survey participants was 31.6 years old.

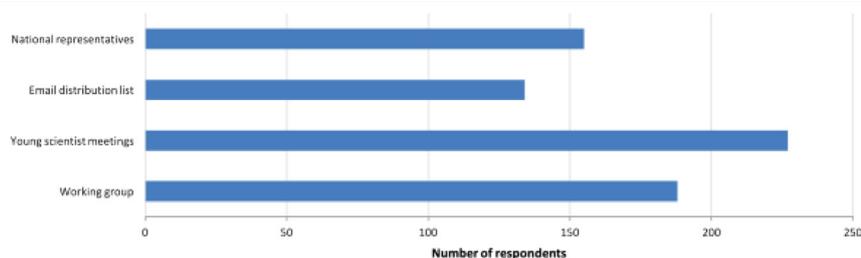
Among respondents, 136 (41%) were specialists, 103 (31%) were residents, 38 (12%) held a PhD degree and 7% were students. Other categories (9%) included laboratory technicians/technologists, PhD students, other MDs and professors.

The answers (number and percentage) of the participants for each closed question are presented in Tables 1–4. Regarding open questions, the most common replies to question 4 ("what don't you like about EFLM?") were:

- I would like to know more. I do not know enough about EFLM ($n = 12$).
- EFLM's activities are poorly advertised. Lack of communication/marketing ($n = 10$).
- There is a need to involve YLMPs much more. Difficulties to get involved as YLMP ($n = 7$).

Table 2: YLMPs network section. Number of respondents for each item and percentage are presented.

Question 5: Do you think there is a need for a network of young scientists in the EFLM?				
Yes	No			
307 (93%)	22 (7%)			
Question 6: If yes, what degree of commitment are you able to have with this initiative?				
Very low	Low	Regular	High	Very high
6 (2%)	26 (8%)	97 (32%)	118 (38%)	60 (20%)
Question 7: If yes, what kind of network would you suggest?				



YLMPs, young laboratory medicine professionals; EFLM, European Federation of Clinical Chemistry and Laboratory Medicine.

- Insufficient bursary programs (n = 4).

When comparing answers from specialists and residents, no statistical differences were seen on their knowledge about EFLM and their activities (Q1; for specialists: mean 2.93 over 5, SD 1.10; for residents: mean 2.79 over 5, SD 0.99), neither on their opinion about the need for a YLMP network (Q5; 94.5% of specialists and 92.2% of residents said yes). In addition, no differences were seen in any item included in question 10.

Within the third section, regarding a potential YLMPs network, the open-question eight referred to the potential purpose and possible activities of such a network. Answers can be grouped in the following suggestions: exchanging experiences among countries (share knowledge), guiding and giving practical advice on daily duties, updating on recent developments (new technology), solving queries (chat), networking and developing recommendations.

As regards the fourth section, on suggestions and opportunities for EFLM, the open-question 12 asked about which opportunities young professionals would like to be offered. Similar to question 11 (Table 3), the preferred initiatives were courses and conferences and scientific exchanges; followed by scholarships/bursaries, job opportunities and a working group for YLMPs.

Discussion

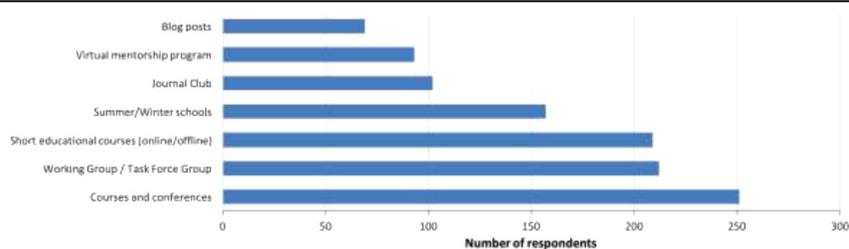
This is the first survey assessing the opinion of European young scientists in laboratory medicine about EFLM. A representative number of individuals participated, from a total of 39 European countries.

The countries with the highest number of participants were Spain, Turkey, and Croatia, in contrast with the few

Table 3: Suggestions and opportunities section. Number of respondents for each item and percentage are presented.

Question 10: Please, rate your degree of agreement with these observations				
	Strongly disagree	Disagree	Agree	Strongly Agree
10A: It is easy for young scientists to get involved with EFLM	15 (5%)	147 (44%)	158 (48%)	9 (3%)
10B: I visit the EFLM website to stay up to date with topics related to my profession	33 (10%)	87 (26%)	170 (52%)	39 (12%)
10C: The information on the EFLM website is useful for my daily practice	14 (4%)	81 (25%)	200 (61%)	34 (10%)
10D: I have attended activities organized by EFLM (congress, courses, webinars ...)	52 (16%)	86 (26%)	151 (46%)	40 (12%)
10E: The EFLM should help more in the early stages of a young scientist's career	10 (3%)	27 (8%)	173 (53%)	117 (36%)
10F: I wish my National Society told me more about EFLM activities	8 (2%)	38 (12%)	185 (56%)	98 (30%)
10G: I wish EFLM promoted networking and scientific exchange between young scientists	6 (2%)	11 (3%)	162 (49%)	150 (46%)

11: What types of activities would you like to be actively engaged in?



YLMPs, young laboratory medicine professionals; EFLM, European Federation of Clinical Chemistry and Laboratory Medicine.

Table 4: Scientific training and exchange section. Number of respondents for each item and percentage are presented.

Question 14: Would you welcome (and attend) a program for formal scientific training (e.g., 2 days full-time) during an EFLM conference?																				
Yes	No																			
299 (91%)	30 (9%)																			
Question 15: If yes, would you be willing to pay a registration for it?																				
Yes	No																			
161 (54%)	143 (46%)																			
Question 16: Which skills would you be interested in?																				
<table border="1"> <thead> <tr> <th>Skill</th> <th>Number of respondents</th> </tr> </thead> <tbody> <tr> <td>Biochemistry</td> <td>265</td> </tr> <tr> <td>Molecular techniques</td> <td>165</td> </tr> <tr> <td>Mass spectrometry</td> <td>135</td> </tr> <tr> <td>Artificial intelligence and Big Data</td> <td>130</td> </tr> <tr> <td>Flow cytometry</td> <td>120</td> </tr> <tr> <td>Cardiac pathology</td> <td>85</td> </tr> <tr> <td>Metrology</td> <td>50</td> </tr> <tr> <td>Robotics</td> <td>50</td> </tr> </tbody> </table>			Skill	Number of respondents	Biochemistry	265	Molecular techniques	165	Mass spectrometry	135	Artificial intelligence and Big Data	130	Flow cytometry	120	Cardiac pathology	85	Metrology	50	Robotics	50
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Metrology	50																			
Robotics	50																			
Question 17: Do you know the Scientific Exchange Programme (EFLMLabX)?																				
Yes	No																			
83 (25%)	246 (75%)																			
Question 18: If yes, did you find any difficulties with this initiative?																				
Economic limitations	Troubles in the laboratory of origin	No place that offered the scientific topic that you are interested in																		
53 (64%)	21 (25%)	17 (20%)																		

YLMPs, young laboratory medicine professionals: EFLM, European Federation of Clinical Chemistry and Laboratory Medicine.

answers obtained from some largely populated countries in Europe (e.g., Germany, France). Such distribution of the responders can be caused by communication difficulties or not so effective information distribution in some countries. Nevertheless, the majority of participants were residents and specialists in clinical chemistry and laboratory medicine, which is thought to properly reflect the current situation of clinical laboratories.

Regarding the questions for the assessment of the opinion of YLMPs about their current status within EFLM (questions 1–4 and 9), the surveyed participants stated that they knew little about this organization (mean: 2.79 over 5, SD: 1.04), with no statistical differences between specialists and residents. The 83% of participants stated that they did receive information about the EFLM, mostly through their national society and an email circulation list, however, one-third of specialists, residents, and PhDs claimed they had little knowledge about EFLM. A similar distribution was observed when asked about the involvement of YLMPs in EFLM (mean: 2.83 over 5, SD: 1.02). Both observations highlight the need for EFLM to get advertised much more in

different countries, mainly through individual National societies. These findings are supported by the answers for question 4 and 10F, where a significant number of respondents stated that they would like to know more about this organization and that communication and marketing should be improved. These requests were demanded similarly by specialists and residents.

When asked about the strengths of EFLM (question 3), the top-rated activities were the congresses and scientific meetings, alongside with scientific publications, while the projects with the lowest consideration were awards and bursary programs. These findings point out the need to establish a periodic award or appreciation for hard-working and excellent laboratory professionals, in addition to a higher number of grants for attending the highly-appreciated conferences.

Regarding the need for a YLMPs network in the EFLM (questions 5–8 and 10G), as similarly established in the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) [8] and most National societies, a compelling number of participants (93%) responded that

they would welcome such initiative, and most of them (59%) would like to be highly involved. YLMs know what they need [9, 10].

Although the format of such a network still needs to be defined, different initiatives were suggested, including specific YLMs meetings (68% acceptance) and a YLMs working group (56% acceptance). Additionally, participants also suggested interesting goals for such a network, especially to foster the exchange of experiences and knowledge among countries, and to guide and give practical advice on daily laboratory duties. In our opinion, they are non-exclusive and probably the combination of some of them would be ideal.

The next group of questions was related to the aspects for EFLM to improve. More than half of participants admitted visiting the EFLM website regularly, which contains useful information for their daily work, and also to have attended courses and conferences organized by EFLM. However, they wish EFLM helped more in the early stages of a YLM's career.

If possible, survey respondents would participate in different projects and activities, especially by attending (online or face-to-face) courses and conferences or by integrating a working group. This answer was emphasized on the open-question number 12, where participants were surveyed about possible opportunities to be offered by EFLM. In addition to courses and conferences, the highlighted answers were scientific exchanges, scholarships and job opportunities in Europe. While the need for more scientific exchange opportunities may be tackled by the EFLMLabX program, job opportunities in Europe would need the harmonization of laboratory medicine training programs throughout Europe, namely by means of the European Specialist in Laboratory Medicine (EuSpLM) certificate.

The last section of questions referred to scientific training and exchange. The majority of YLMs would like to attend formal scientific meetings during EFLM congresses and half of those would not mind paying for it. The most demanded areas in laboratory medicine for additional training were biochemistry, molecular techniques, and mass spectrometry. As for the recently started EFLMLabX project, whose aim was to create a network of medical laboratories offering practical training in Europe, 25% of respondents admitted knowing about this initiative, however, economic difficulties were reported by 53 participants as its main issue. Then, this initiative should be promoted among YLMs, and the national societies could be the cornerstone to spread this information.

This survey was designed to get a general idea about the current thoughts of YLMs about EFLM and, based on

those, to design future strategies in order to increase their knowledge and get more involved in this organization. In our opinion, the first steps for EFLM to increase the participation of young laboratory professionals in their activities are to foster and improve their advertising and marketing techniques. EFLM prepares a compelling number of excellent and rigorous activities that need to be properly disseminated to increase participation. For that, the role of national societies and presidents are pivotal, as only they have the capacity to reach the individuals within a specific region [11].

The path for a YLM is sometimes difficult and challenging [12, 13]. Comments and appreciations on specific topics have brought to light different initiatives that can be started, including the need for a meeting of (specifically) young scientists as a good opportunity for networking and professional and scientific discussions in our continent. In our opinion, proposals by YLMs should be taken into serious consideration by EFLM's Executive Board and integrated into their meeting plans.

International meetings and congresses are perfect moments to share experiences and present EFLM's work. However, suggestions by some respondents have emphasized that also workshops and other small group activities would promote laboratory medicine better than conferences *per se*. The point is to have a clear professional goal.

Conclusions

In conclusion, YLMs demand better connection among them to gather and share concerns about their daily healthcare duties, to keep updated with new advancements and to face future challenges together. EFLM should nurture and help European young scientists grow from the very beginning and give them a platform to have their voices heard. Innovation comes with enthusiasm and cooperation.

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