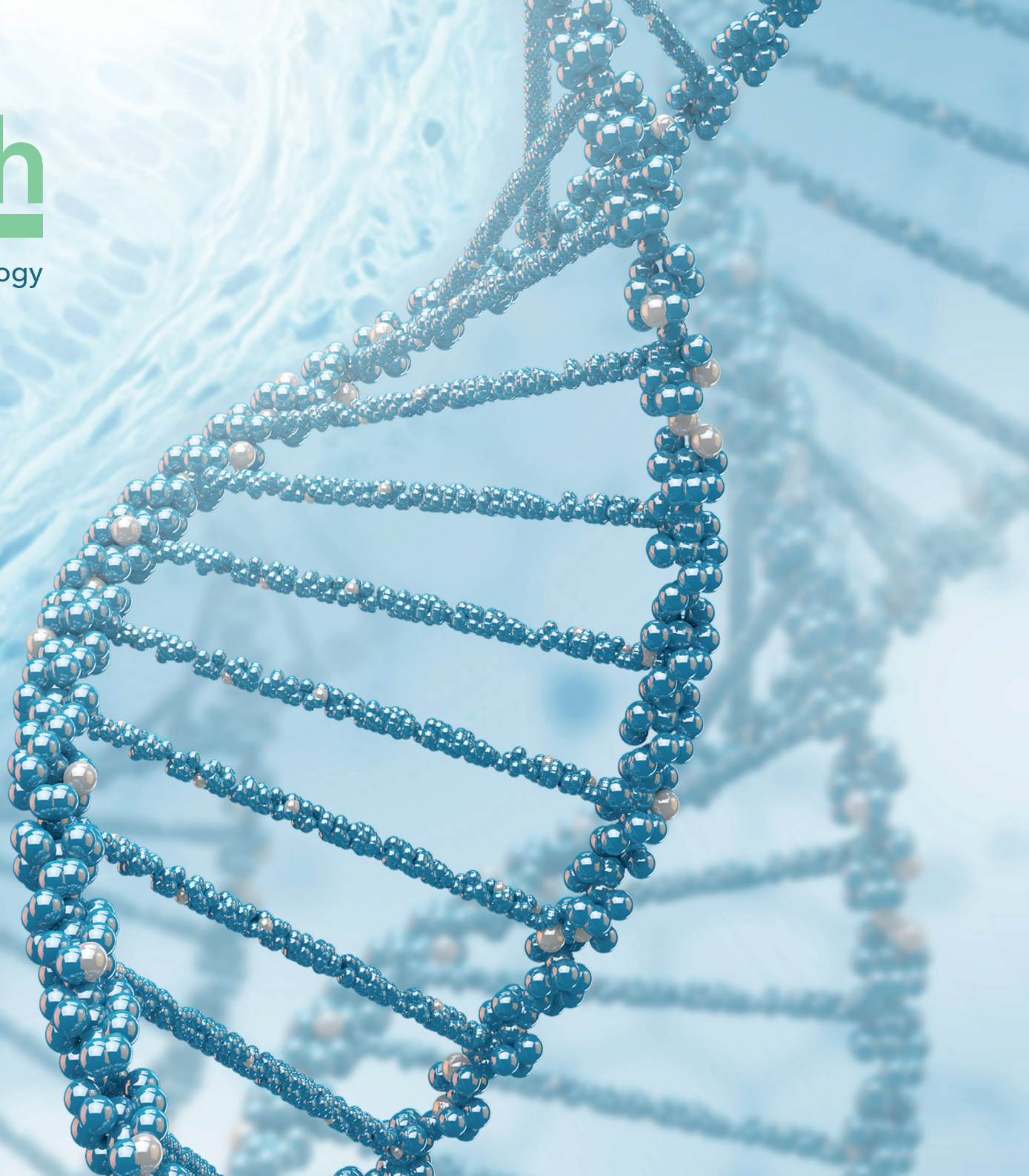


# IQNPath

International Quality Network for Pathology

Annual Report  
2017



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## Welcome letter from the President

Quality is difficult to define. Since time immemorial, philosophers have tried to describe it and every human being has clung to their own ideas of what quality means to them. Quality in pathology is a multifaceted issue: when it comes to pathological evaluation to determine the treatment of a patient, high quality is vital in terms of reliability, objectivity, timeliness, repeatability and clarity. In this era of precision medicine, quality must be proven: to patients, treating physicians and of course, to the pathologist.

Pathologists need to have confidence that the data and slides they are working with are reliable, especially for results that come out of processes which for most pathologists are a bit of a black box. This modern kind of working is very different from the traditional microscopic evaluation of a slide, which is both tangible and can be directly assessed for quality. This gap was quickly recognised by many organizations and the result was, in addition to existing quality measures, the development of External Quality Assessment (EQA).

With the increased scope and importance of molecular pathology, the need for scientific foundation, harmonization and expansion of these EQA programs has become urgent. IQN Path fills this gap and brings together many organizers of EQA pathology programs. IQN Path, being an international organization, also forms a network of stakeholders, including professional pathology organizations, pharmaceutical industry and diagnostic companies. Even although IQN Path has been in operation a mere two years, in this report you will find several examples of its ongoing success!

It may be difficult to precisely define quality in pathology, but by showing that a test result is reliable is a very important start.

Sincerely,



**Prof Han van Krieken**  
President,  
IQN Path ASBL

## A note from the Executive Director

It is with great pleasure that we publish this Annual Report for the second year of IQN Path. It is with the support and expertise of the IQN Path network and our membership and sponsors that we will take the mission of IQN Path forward in future years. It is a pleasure to work alongside such dedicated and enthusiastic professionals. We appreciate all your contributions, suggestions and hard work.

Thank you to all our members!

*Jacqueline Hall*



**Jacqueline Hall**  
Executive Director,  
IQN Path



## About IQN Path

**IQN Path is an international multi-stakeholder group focused on improving the quality of clinical biomarker testing through best practise in External Quality Assessment (EQA). IQN Path is a not-for-profit membership organisation registered in Luxembourg.**

### About EQA

Clinical implementation of personalized medicine means that biomarkers and new technologies for their detection are increasingly being used in pathology. Accurate biomarker testing can assist in diagnosis and can modernize patient treatment with targeted therapies. To ensure optimum patient outcomes, it is necessary to employ rigorous quality management, using internationally recognized standards. EQA is therefore becoming increasingly recognized as a critical part of the process for promoting quality in tissue-based pathology, including liquid biopsy.



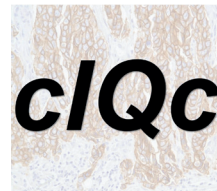
# The 2017 Membership of IQN Path

## EQA members 2017

IQN Path's membership is drawn from organizations and stakeholders invested in the quality implementation of biomarker testing in pathology. Our founding and current academic members are detailed below:



DEUTSCHE  
GESELLSCHAFT FÜR  
PATHOLOGIE E.V.  
Seit 1897 - dem Leben verpflichtet



## Corporate members 2017

IQN Path also has corporate sponsor members and activities that are supported by our corporate stakeholders. IQN Path would like to extend its appreciation to all sponsors of IQN Path activities:

### GOLD MEMBERS



### SILVER MEMBERS



### BRONZE MEMBERS





## Aims of IQN Path

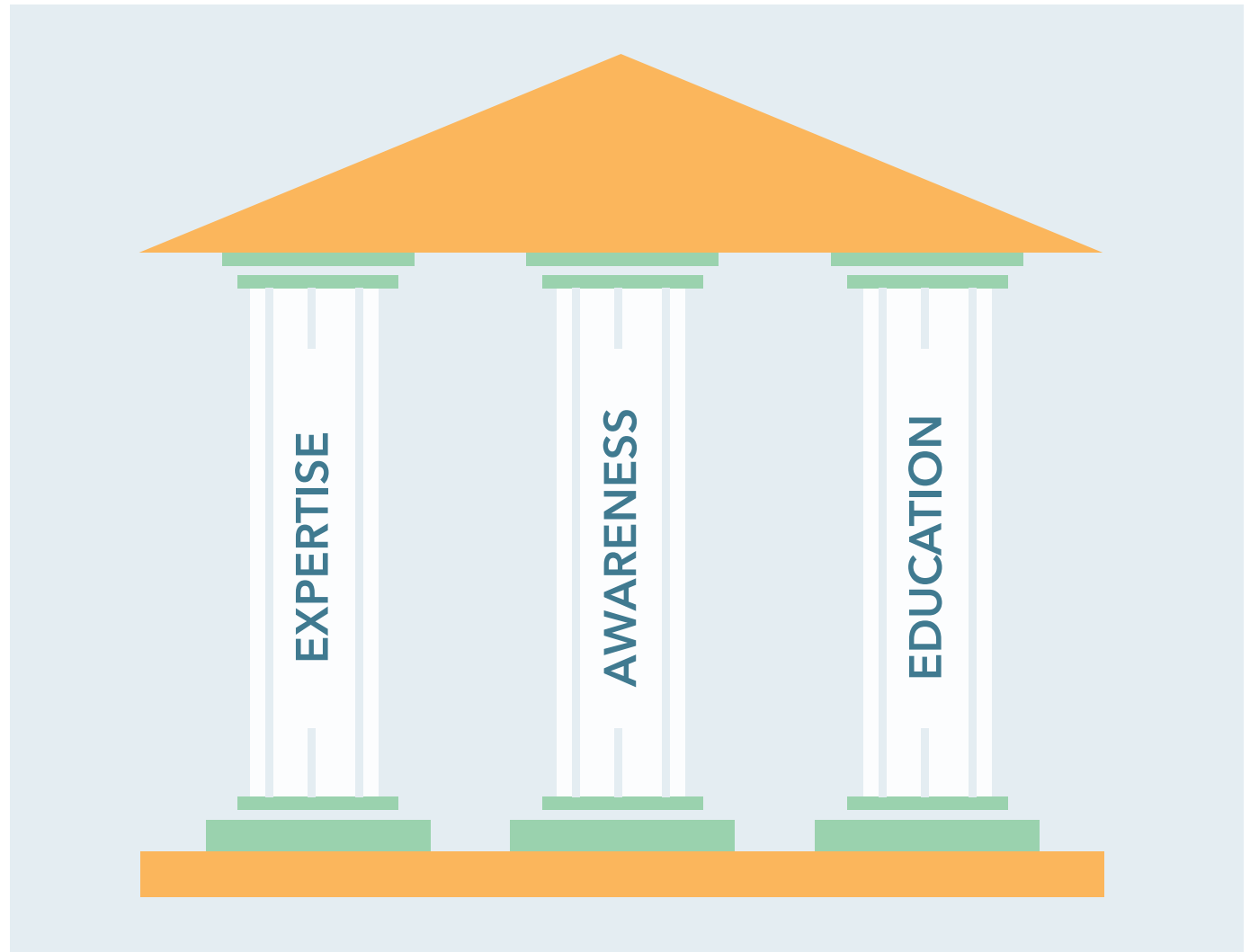
IQN Path aims to improve the quality, accuracy and accessibility of EQA in order to promote optimal patient care. These aims are implemented through:

**Expertise** peer discussion of key issues and establishment of best practice guidelines

**Awareness** lead policy development and promote knowledge of and access to EQA

**Education** training, workshops, conferences and research bringing our work to the public domain

Figure 1. The aims of IQN Path





Delivering our  
aims in 2017

2017 was a productive year for IQN Path. From working groups to journal publications, we continued to raise the profile of EQA, laboratory quality and of course, IQN Path.

## Expertise: the IQN Path Working Groups

IQN Path is organised into working groups, within which we have projects focussed on specific topics deemed important by the group.

### IQNPath Liquid Biopsy Group

Four EQA providers came together under IQN Path to address the plasma ctDNA testing challenges currently facing diagnostic laboratories: the Association Italiana di Oncologia Medica (AIOM), European Molecular Genetics Quality Network (EMQN), European Society of Pathology (ESP) EQA and the United Kingdom National External Quality Assessment Service (UK NEQAS) for Molecular Genetics. This project encompassed three main areas of work: 1) an initial survey of laboratories to assess the prevalence of testing methods used and the need for ctDNA EQA, 2) an EQA pilot for lung and colorectal cancer where reference materials were designed and distributed to 32 laboratories to gather initial data and test EQA design and feasibility and 3) a workshop for laboratories on ctDNA

testing covering methods, applications and the main findings from the ctDNA EQA pilot.

#### cfDNA Laboratory Survey

An online survey for laboratories on the methods and current uses of cfDNA was conducted and the results were published in *Virchows Archiv*. The results of the survey demonstrated the interest in ctDNA testing, the intention of laboratories to adopt it for clinical testing and the need for appropriate EQA to support this.

Zandra C. Deans *et al.* Review of the implementation of plasma ctDNA testing on behalf of IQN Path ASBL: a perspective from an EQA providers' survey. *Virchows Archiv*. December 2017, Volume 471, Issue 6, pp 809-813



### cfDNA EQA Pilot

To assess the current standard of ctDNA testing and to assess the feasibility of implementing an EQA for ctDNA in general practice, a pilot EQA scheme was organized by four EQA providers under the umbrella of IQN Path. Thirty-two laboratories received five samples for epidermal-growth-factor receptor (*EGFR*) analysis and/or five samples for rat sarcoma viral oncogene (*RAS*) analysis. Samples were artificially manufactured ctDNA in real plasma and variants were spiked at two allelic frequencies of 1% and 5%. The reference samples were validated by five reference laboratories prior to sending. The results of the analysis have been written up and a publication entitled "International pilot External Quality Assessment scheme for analysis and reporting of circulating tumour DNA" has been submitted to a peer review journal and is currently under review. We hope to see this work published soon. Any news will be announced on the IQN Path website.

### IQN Path cfDNA Workshop, Florence

On the 23rd June in Florence, Italy, IQN Path organized the first IQN Path workshop on cfDNA testing. The meeting had over 100 registrants and drew attendees from 23 different countries, demonstrating the importance and interest in the topic of quality of cfDNA testing. The one day workshop entitled, 'From sample collection to clinical integration of the results - ensuring end to end quality' was divided into educational sessions on different topics relating to the details of cfDNA testing. There was also a breakout session in the afternoon which involved delegate participation. See Appendix 2 for the workshop agenda.

In the educational session, in-depth technical topics ranged from blood drawing and collection tubes, cfDNA extraction methods, methodologies for cfDNA testing, current clinical applications, an introduction to quality processes and the importance of quality, and the initial results of the IQN Path pilot for cfDNA that had been organized by UK NEQAS Molecular Genetics, EMQN, ESP QA and AIOM under the umbrella of IQN Path.

There was also a series of talks from companies describing the new tools and technologies available in the field. Talks were given by Biocartis, Seracare, Qiagen, Horizon Diagnostics and ThermoFisher Scientific. The summary and outcomes of the ctDNA workshop discussion are currently being written up into a white paper.

We would once again like to thank the sponsors of the cfDNA programme and the supporters of the ctDNA workshop.

Amgen, AstraZeneca, Merck KGA, Sysmex Inostics, Boehringer Ingelheim, Roche, Thermo Fisher Scientific, Biocartis, Horizon Diagnostics, Seracare, and Qiagen.



Thank you to EMQN, UK NEQAS, AIOM and ESP QA for leading the project.



## IQNPath Molecular Pathology Group

In 2013, before IQN Path was constituted, a small group of EQA providers came together to write a consensus document on the design of molecular pathology EQA, resulting in this article:

J. Han van Krieken ., Guideline on the requirements of external quality assessment programs in molecular pathology, *Virchov's Archiv*, 2013, 462:27-37.

The article addressed topics such as: the organization of an EQA programme, criteria for a reference laboratory, requirements for EQA samples, numbers of samples for testing, scoring systems, reports and managing poor performance. During discussions in the Naples 2016 meeting, several EQA groups expressed interest in updating this document, to bring it up to date with today's practices. The purpose of this new project to explore, discuss and harmonize practices between EQA providers and update our recommendations.

## IQNPath The *In-situ* Methods Group

This group is actively working on the IQN Path PD-L1 digital education portal for EQA, to support quality of PD-L1 staining interpretation. This is to be an online self-assessment tool for pathologists and scientists to self-test and train on the interpretation of slide images. The pathologists and scientists will log-in, view and self-test on high quality reference material that is presented in a consistent manner and which will be scored by an expert committee of pathologists appointed by the participating EQA providers.

The portal will comprise digital slides stained with the four different FDA approved tests, namely 28-8, 22C3 (Agilent) and SP142 and SP263 (Roche). The portal will start with lung cancer cases with plans to extend to other diseases in the near future. CADQAS (a community interest company or CIC) based at the Poundsbury Cancer Institute, UK is supporting the project on the technical aspects, including digital library scanning and the preparation and management of the digital platform software.

This combined slide resource will be made available by participating IQN Path member EQA providers, so that the self-assessment can be made available to pathologists through the EQA scheme in their region. In this collaboration we aim to help the EQA providers provide high quality materials for use in EQA and to harmonize activities between different groups, by working with the same reference materials and obtaining input from all the participating EQAs into the project design.



We would like to thank the sponsors of the PD-L1 project and also to thank CADQAS for their support in delivering the goals.

**AstraZeneca, BMS, Merck KGaA, MSD, Genentech, Agilent, Roche**



Thank you to **Philips** and **CADQAS** for providing technical support



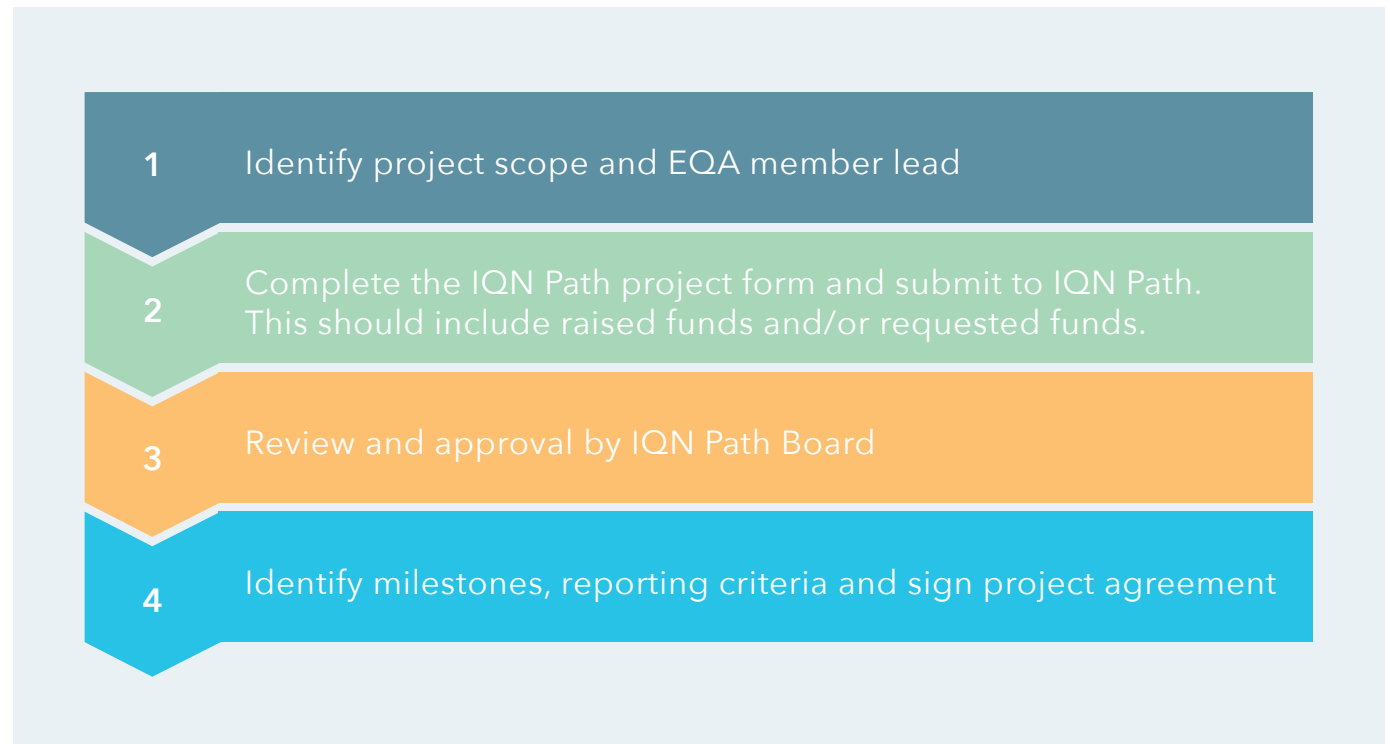
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# Projects 2017

## New project proposal submission process

In 2017, IQN Path established a new project submission process, so that EQA members creating a group to work on different challenges can submit their project for financial support (where available) and endorsement from IQN Path. Projects funded by IQN Path are subject to IQN Path policies.

**Figure 2: Flow diagram of the grant application / project submissions process.**





## Projects approved in 2017

**In the first year of establishing the project submission process, IQN Path received several applications, listed below.**

### PD-L1 Educational Portal

This project is currently in progress within the IHC/FISH working group (see above). The proposal was born from discussions at a previous working group meeting in Cologne 2016. The project was submitted to IQN Path by Keith Miller of UK NEQAS for ICC and ISH in February 2017, whereupon it was approved. The project is currently underway but is still seeking top-up funding, therefore any interested IQN Path corporate sponsor members are encouraged to make contact to discuss in more detail. The PD-L1 project is being supported by the PathXL software from Philips. Technical expertise, slide scanning and other assistance is being delivered by CADCAS, a community interest company registered at the Poundbury Cancer Centre, Dorset, UK.

### Update of the EQA molecular guidelines

As a result of discussions in Naples 2016, and the group's interest in updating the 2013 guidelines on molecular EQA (see above), a project submission with a request for funding by IQN Path was submitted to IQN Path and approved by the Board in 2017. The project is being led by Professor Els Dequeker of Leuven University in association with the ESP QA, and the work is currently under development in the Molecular EQA Working Group. A questionnaire has been distributed to EQA providers in order to identify current practices and variations. The initial results of the EQA provider survey will be presented in the 2018 Naples meeting. From this, the goal is to update the EQA guidelines published in 2013.

### Persistently poorly performing laboratories

A second related project on the topic on the management of persistently poorly performing laboratories was submitted to IQN Path with a request for funding. This project is also led by Professor Els Dequeker of Leuven University and was approved by the IQN Path Board in 2017. This project will conduct a review within the EQA provider members of how persistently poorly performing laboratories are managed for

biomarker testing in tissue-based EQAs. The review will take the form of a questionnaire and it is hoped that the results, which are expected in 2018, will lead to further projects that will improve the quality of laboratory testing.

### Tumour Mutation Burden

A new proposal coordinated by Nicola Normanno of AIOM, Naples, was submitted to IQN Path at the end of 2017, for launch in 2018. The project is currently seeking funding and any interested IQN Path corporate sponsor members are encouraged to make contact to discuss in more detail. The main purpose of this project is to evaluate the appropriate design of EQA for Tumour Mutation Burden (TMB) testing. As different methods for TMB assessment are becoming available, IQN Path proposes a harmonization study to generate an index that allows the TMB scores of different tests to be mapped to one another. In addition, it is essential to validate control material for use in EQA schemes in TMB testing, so the project will culminate in a pilot phase of an EQA scheme for TMB, in order to test feasibility. It is hoped that the results will inform and define future recommendations for TMB assessment. The project will last around 16 months and will culminate in a workshop for laboratories, if funding permits.

# Conferences, Presentations and Meetings



## IQN Path Annual General Meeting and the Naples meeting



The second weekend in May saw the 6th EQA annual meeting hosted in Naples. Delegates included stakeholders and representatives of EQA providers from across the world, including pathologists, microbiologists, geneticists, quality managers, medical oncologists, representatives of the pharmaceutical companies, vendors of controls and standards for diagnostic methods and equipment and representation from the European Federation of Pharmaceutical Industries and Associations / European Biopharmaceutical Enterprises.

There was great collaborative input and discussion. Topics discussed included the quality of liquid biopsy testing, the challenges associated with the implementation of Next Generation Sequencing and PD-L1 assessment.

The 2nd Annual General Meeting of IQN Path ASBL was also incorporated into the event. The meeting was well attended by EQA providers, with participants from across the world. Several new research projects were suggested and IQN Path will seek to prioritise these and support the start of new project proposals. Appendix 1 contains the detailed programme of the Naples 2017 meeting.



## IQN Path Booth at the European Congress of Pathology

IQN Path ASBL hosted its inaugural exhibition booth at the 29th European Congress of Pathology in Amsterdam in September 2017. We were delighted to meet so many IQN Path members as well as chat to representatives from laboratories seeking to join EQA schemes. After meeting us at the booth, we were delighted to have two new corporate members joining IQN Path for 2018.

The IQN Path Slide-based molecular methods (IHC) working group also took the opportunity to meet during the ECP.



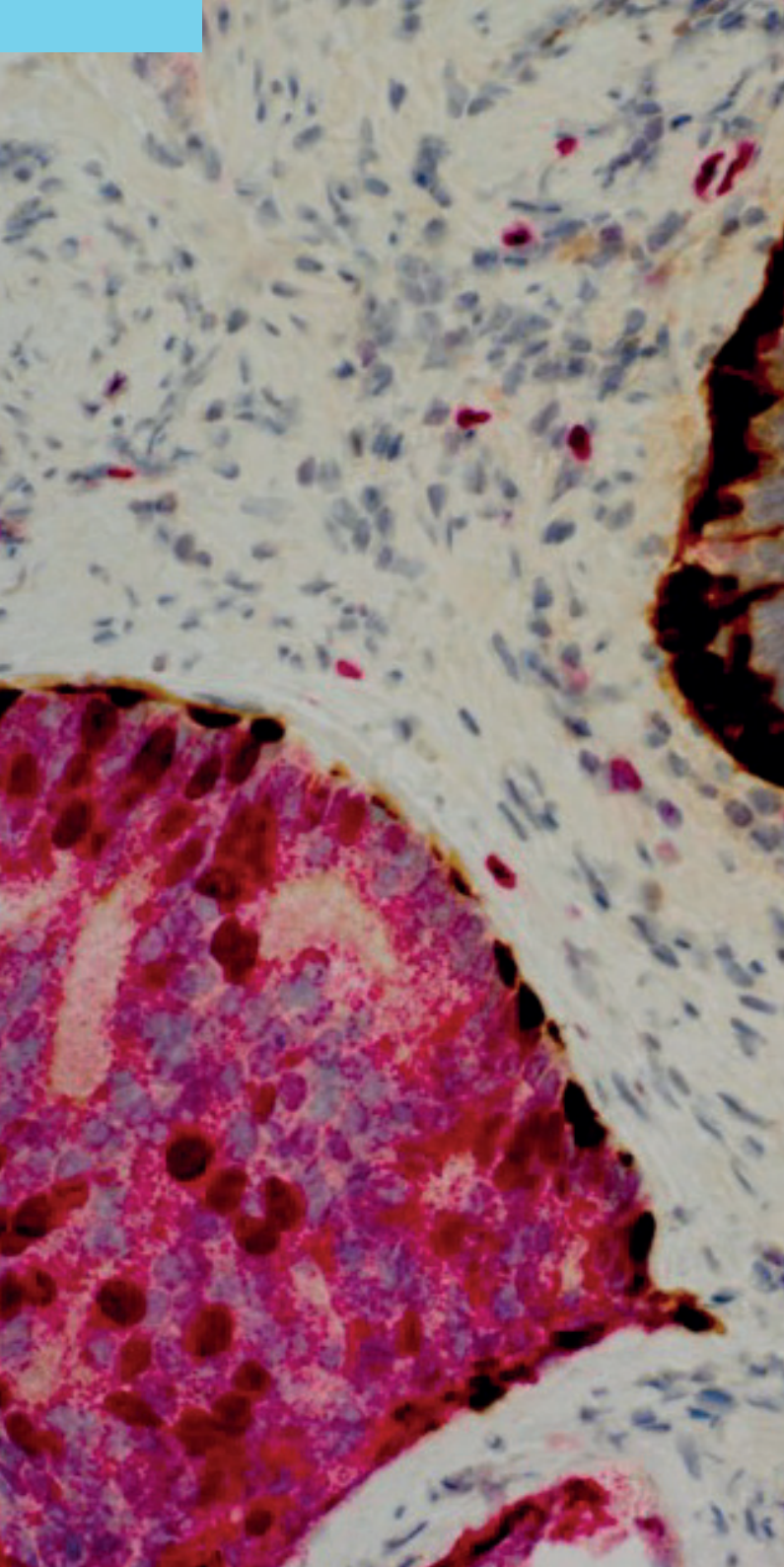


## Conferences where IQN Path activities were presented

Our members are busy spreading the word about IQN Path and disseminating the results and findings of our projects and work.

Here are just some of the 2017 events which were enhanced by IQN Path's activities and data.

<b>January</b>	Visiopharm User Group Meeting, Copenhagen
<b>February</b>	AZ PD-L1 Meeting, Alderley, Manchester; Roche PD-L1 workshop, Barcleona
<b>April</b>	AZ Ad Board, Heathrow; Pfizer AD Board, London; Roche Americas Cancer Meeting, Tucson
<b>July</b>	Roche China, Chengdu; 1st Annual European Congress on Lung Cancer, Barcelona
<b>August</b>	Roche Pharma, Rio
<b>September</b>	Poundbury workshop for SP263- CD; ESP Amsterdam: "Symposium ESP 2017" Solutions to the NSCLC Testing Challenge; ESMO Congress Madrid; Avellino "Il Carcinoma Polmonare non a Piccole Cellule"
<b>October</b>	Abbvie Ad Board on lung cancer; Abbvie Ad Board on Glioblastoma; Roche Diagnostics User Group Meeting in Nottingham; Roche Sales Meeting in Barcelona; Belgrado 3rd Congress of the Serbian Association for Cancer Research (SDIR) with International Participation 'Challenges in anticancer research: translation of knowledge to improve diagnosis and treatment'; AIOM Roma XIX Congresso Nazionale
<b>November</b>	November NHS Bootcamp Meeting at the Royal Society of Medicine; AZ Lung cancer meeting in Rome; Reggio Emilia 2nd International Congress: Clinical Needs and Translational Research In Oncology; Creta: Congress on Clinical and Translational Oncology IQN Path presentation at AMP Reference Materials forum, Salt Lake City, USA title: "Reference Materials for EQA: An EQA Providers Perspective from IQN Path"
<b>December</b>	ESMO, Switzerland



## **IQN Path promotes publications on quality in pathology**

Following an approach from IQN Path ASBL, and with the support of the European Society of Pathology (ESP), we are proud to announce that *Virchows Archiv*, the official journal of the ESP, will be launching a special edition entitled 'Quality in Pathology'. The aim of this special edition is to create a channel for publications and articles related to quality issues and EQA in pathology. It can be challenging to find a suitable journal home for publishing data on quality research, therefore IQN Path seeks to promote ways to make data available and to encourage publications on the subject.

## IQN Path Publications

IQN Path published several articles in 2017, listed below.

### Next Generation Sequencing

Deans ZC, Costa JL, Cree I, Dequeker E, Edsjö A, Henderson S, Hummel M, Ligtenberg MJ, Loddo M, Machado JC, Marchetti A, Marquis K, Mason J, Normanno N, Rouleau E, Schuurin E, Snelson KM, Thunnissen E, Tops B, Williams G, van Krieken H, Hall JA; IQN Path ASBL. Integration of next-generation sequencing in clinical diagnostic molecular pathology laboratories for analysis of solid tumours; an expert opinion on behalf of IQN Path ASBL. *Virchows Arch*. 2017 Jan; 470(1): 5-20.

### Liquid Biopsy

Deans ZC, Williams H, Dequeker EMC, Keppens C, Normanno N, Schuurin E, Patton SJ, Cheetham M, Butler R, Hall J; On behalf of IQN Path ASBL. Review of the implementation of plasma ctDNA testing on behalf of IQN Path ASBL: a perspective from an EQA providers' survey. *Virchows Arch* 2017 Dec; 471(6): 809-813.

Submitted article: 'An international pilot External Quality Assessment scheme for analysis and reporting of circulating tumour DNA'. Look out for it in the coming months.

### Immunohistochemistry

Cheung CC, D'Arrigo C, Dietel M, Francis GD, Gilks CB, Hall JA, Hornick JL, Ibrahim M, Marchetti A, Miller K, van Krieken JH, Nielsen S, Swanson PE, Taylor CR, Vyberg M, Zhou X, Torlakovic EE; From the International Society for Immunohistochemistry and Molecular Morphology (ISIMM) and International Quality Network for Pathology (IQN Path). Evolution of Quality Assurance for Clinical Immunohistochemistry in the Era of Precision Medicine: Part 1: Fit-for-Purpose Approach to Classification of Clinical Immunohistochemistry Biomarkers. *Appl Immunohistochem Mol Morphol*. 2017 Jan;25(1):4-11.

Cheung CC, D'Arrigo C, Dietel M, Francis GD, Fulton R, Gilks CB, Hall JA, Hornick JL, Ibrahim M, Marchetti A, Miller K, van Krieken JH, Nielsen S, Swanson PE, Taylor CR, Vyberg M, Zhou X, Torlakovic EE; From the International Society for Immunohistochemistry and Molecular Morphology (ISIMM) and International

Quality Network for Pathology (IQN Path). Evolution of Quality Assurance for Clinical Immunohistochemistry in the Era of Precision Medicine: Part 4: Tissue Tools for Quality Assurance in Immunohistochemistry. *Appl Immunohistochem Mol Morphol*. 2017 Apr; 25(4):227-230.

Torlakovic EE, Cheung CC, D'Arrigo C, Dietel M, Francis GD, Gilks CB, Hall JA, Hornick JL, Ibrahim M, Marchetti A, Miller K, van Krieken JH, Nielsen S, Swanson PE, Vyberg M, Zhou X, Taylor CR; From the International Society for Immunohistochemistry and Molecular Morphology (ISIMM) and International Quality Network for Pathology (IQN Path). Evolution of Quality Assurance for Clinical Immunohistochemistry in the Era of Precision Medicine - Part 2: Immunohistochemistry Test Performance Characteristics. *Appl Immunohistochem Mol Morphol*. 2017 Feb;25(2):79-85.

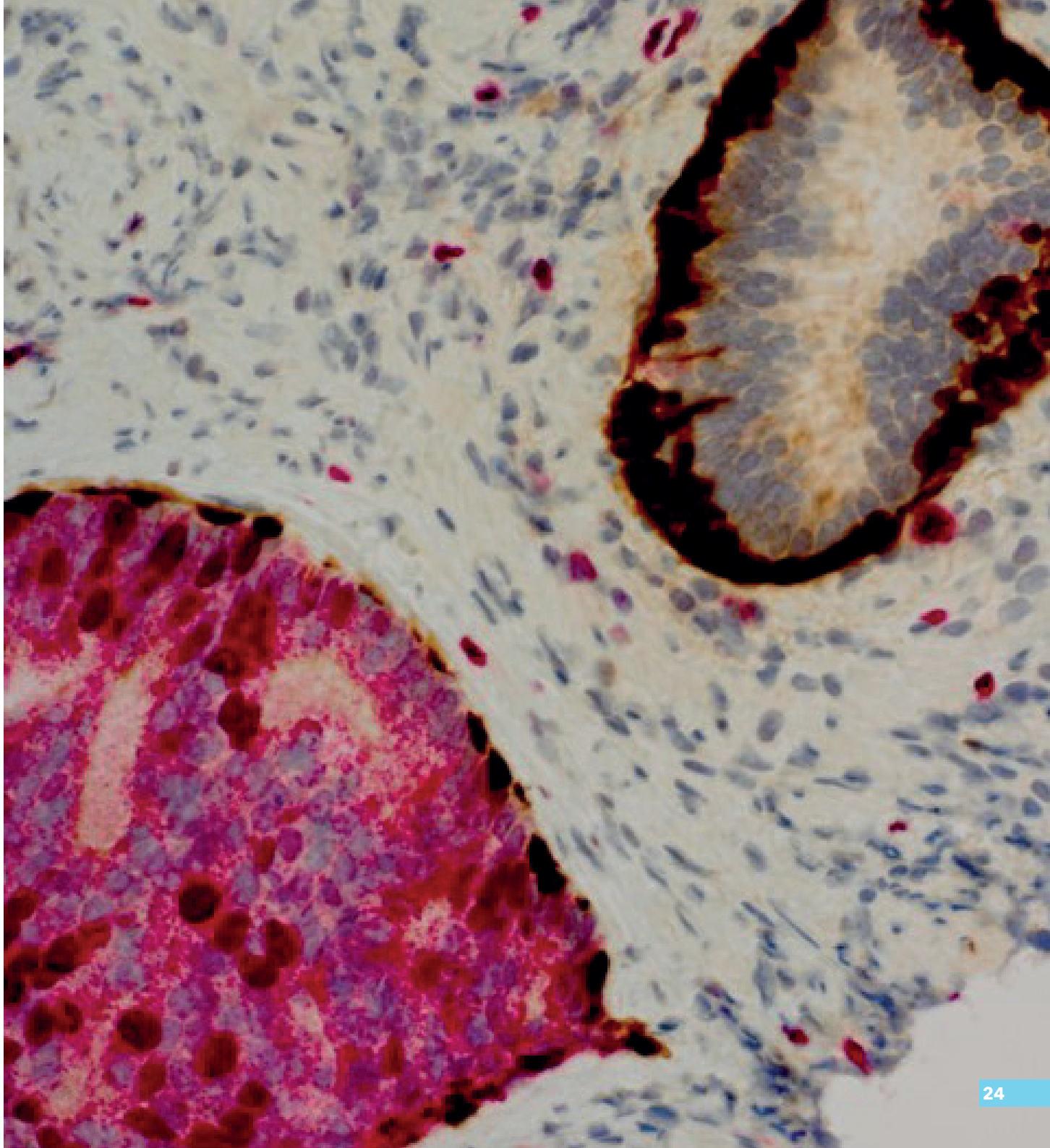
Torlakovic EE, Cheung CC, D'Arrigo C, Dietel M, Francis GD, Gilks CB, Hall JA, Hornick JL, Ibrahim M, Marchetti A, Miller K, van Krieken JH, Nielsen S, Swanson PE, Vyberg M, Zhou X, Taylor CR; From the International Society for Immunohistochemistry and Molecular Morphology (ISIMM) and International

Quality Network for Pathology (IQN Path). Evolution of Quality Assurance for Clinical Immunohistochemistry in the Era of Precision Medicine. Part 3: Technical Validation of Immunohistochemistry (IHC) Assays in Clinical IHC Laboratories. *Appl Immunohistochem Mol Morphol*. 2017 Mar;25(3):151-159.

### Other publications by IQN Path

Hall J, Walker E, Tristram C, Garratt J, Sheppard B; A Quality Undertaking-Connecting EQA and industry to ensure quality diagnostic testing. [www.thepathologist.com](http://www.thepathologist.com) ed. 1017; Oct 2017

Hall J. Laboratory administration Quality External quality assessment and proficiency testing. [www.pathlogyoutlines.com](http://www.pathlogyoutlines.com); Dec 2017





A decorative graphic on the left side of the slide, consisting of a complex network of white lines and dots on a light gray background. The dots are arranged in a somewhat circular pattern, and the lines connect them in a web-like structure, creating a sense of interconnectedness and data flow.

# Financial Summary 2017

# Financial Summary 2017

A summary of the financial position of IQN Path for 2017 valued in Euros.

## Expenditure

**Table 1. Expenditure in 2017 compared to the previous year**

MEMBERSHIP		
	2017	2016
Corporate	192,227	168,023
Academic	53,000	12,000
<b>Total Membership Income</b>	<b>245,227</b>	<b>180,023</b>
Staff	98,967	94,728
Accounts and legal	20,575	8,132
Conferences	10,045	4,191
Advertising and PR	3,139	
Travel (members and staff)	8,425	3,530
Website & Publications	993	2,520
Software	1,646	874
Office Supplies	502	574
Subscriptions	365	
VAT (cost)	12,440	
Differences on Exchange		5,141
<b>Total Membership Expenditure</b>	<b>158,135</b>	<b>119,690</b>
<b>Membership Surplus for the year</b>	<b>€ 87,092</b>	<b>€ 60,333</b>

*IQN Path ASBL has a partial-VAT exemption, VAT costs shown here are the proportion of VAT which IQN Path must pay, incurred from the previous year.*

## IQN Path project-based grants approved in 2017\*

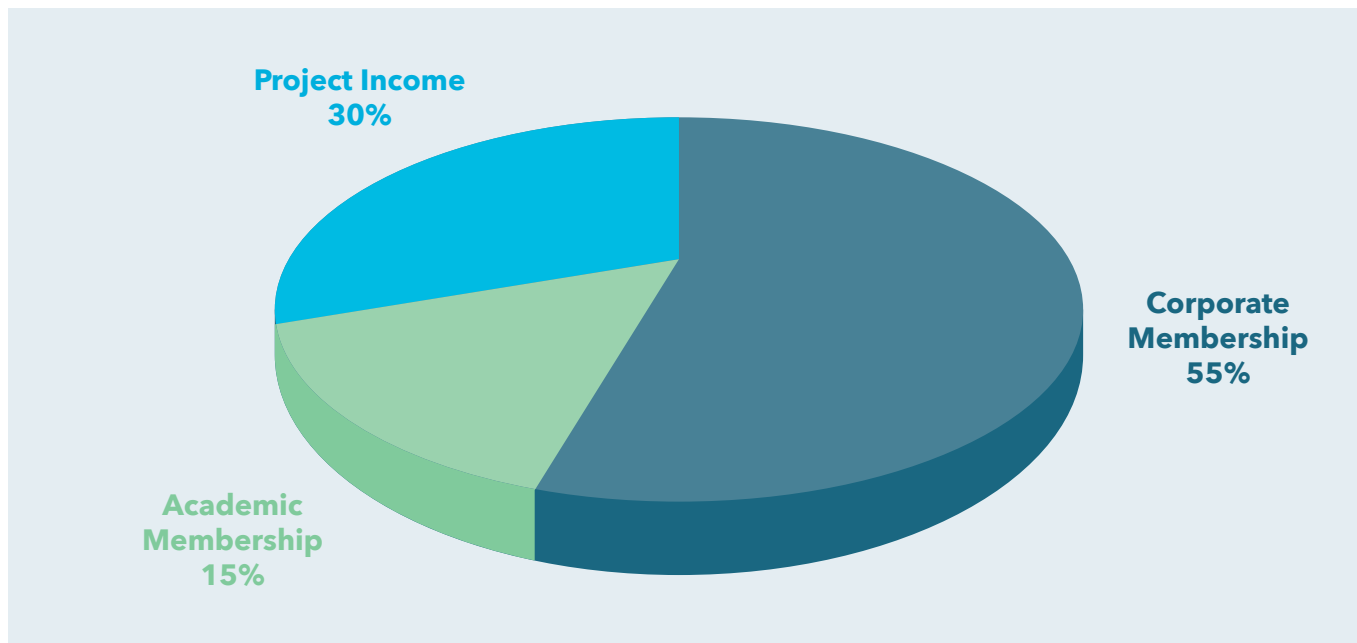
PROJECT	LEAD INVESTIGATOR	AMOUNT	START DATE
Update of the EQA molecular guidelines	Els Dequeker, ESP QA	5000 EUR	July 2017
Methods for managing persistently poorly performing labs (survey)	Els Dequeker, ESP QA	5000 EUR	July 2017

\*Funds may be paid in 2018

## Income

### Project & Membership Income

**Figure 3. A pie chart illustrating the proportions of IQN Path income in 2017**



## Growth in Membership Income

During the year membership income has risen by 36% on 2016 income. Corporate membership was €192,227 representing a growth of 14% from the previous year. Academic membership has grown to €53,000.

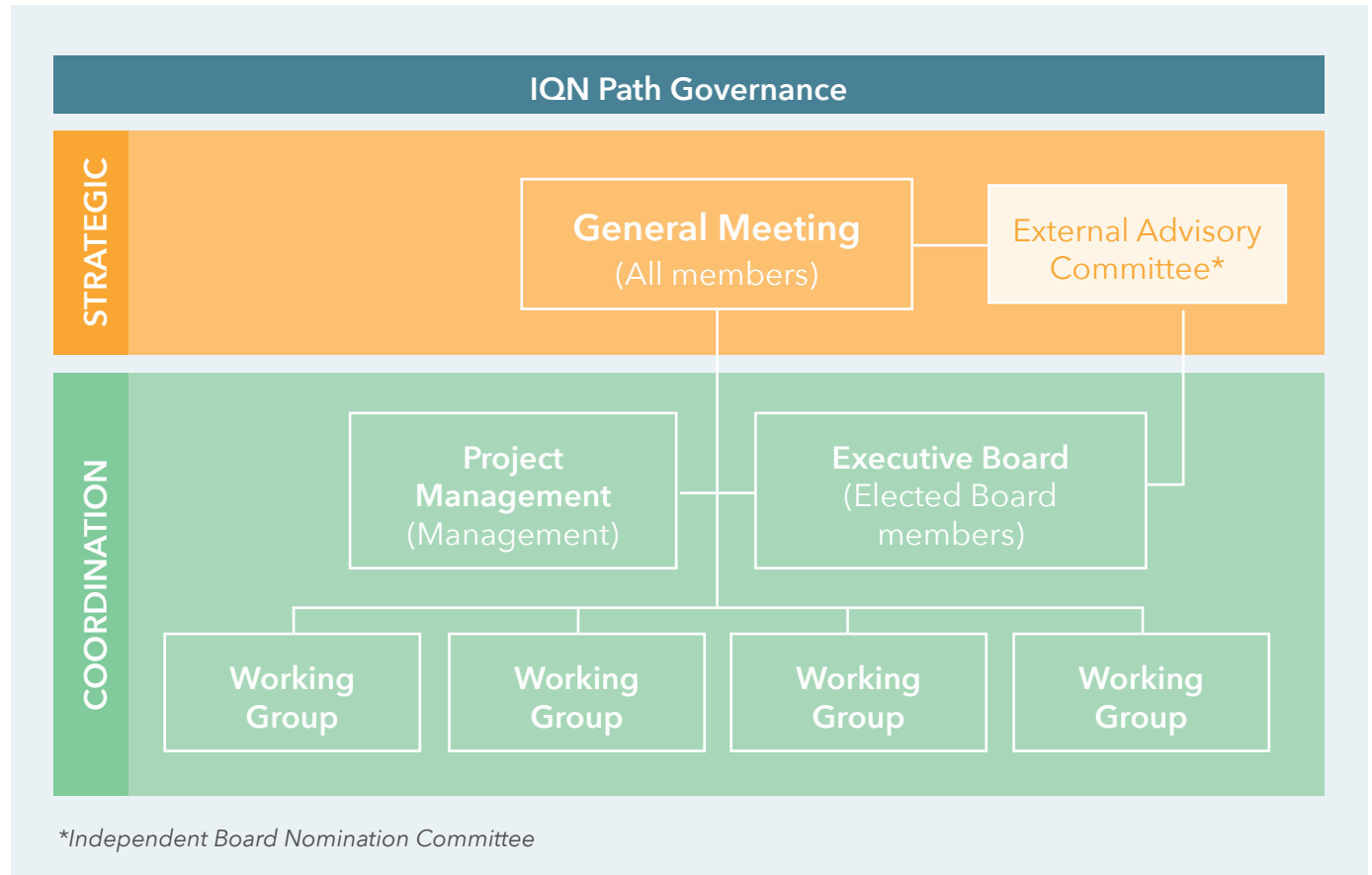


# Governance

IQN Path has now been in operation for two years. Our members subscribe to the principles and policies of IQN Path to promote transparency and harmonization. In order to maintain and promote these principles, IQN Path implements a governance structure and policies to support operations.

### Overview of Governance

Figure 4. The governance structure of IQN Path ASBL





## IQN Path Board

2018 sees the end of term of IQN Path's Founding Board, which has nurtured and grown IQN Path during the set-up, foundation and first years of operation. IQN Path would like to thank the Founding Board members for all their support and efforts in bringing the organization to a strong position for future growth.



Han van Krieken



Dina Tiniakos



Sandi Deans



Etienne Rouleau



Manfred Dietel



Mogens Vyberg



Nicola Normanno



Jacqueline Hall  
Executive Director

Going forward, IQN Path is establishing an election processes, under the oversight of the Independent Executive Board Nomination Committee (IBNC) committee. These documented processes are available in the IQN Path members area. Following recommendation from both the IBNC and the Founding Board, IQN Path has implemented a rotation system: two Board members will step down and their positions will be filled by two new candidates. The staggered change will help ensure continuity of IQN Path's missions and objectives. If more than two candidates come forward for the two available seats, elections shall be held and the membership asked to vote.

IQN Path is now actively seeking for expressions of interest from within the EQA scheme membership, to fill the seats of Han Van Krieken and Sandi Deans. These positions will be effective after the AGM in May 2018.

## Establishing the Independent Executive Board Nomination Committee (IBNC)

As part of the IQN Path statutes and IQN Path governance structure, IQN Path is required to establish an IBNC, which was constituted for the first time in 2017, in advance of the upcoming board elections.

The role of the committee is to assist in a governance capacity and to ensure effective functioning of the IQN Path Board. The key functions of the IBNC are anticipated to be:

- Establishment and oversight of the IQN Path Board election process
- Documentation of the process of appointments to the Executive Board
- Evaluation of performance concerns involving any Executive Board member
- The right to call an extraordinary General Meeting in case of any urgent governance matters

## Composition of the IBNC

The IBNC will comprise three to five people who will serve for three years. Candidates are self-nominated and are drawn from the General Membership of IQN Path. This means that the committee can contain representatives of different membership categories as well as organizations affiliated with IQN Path, including partners and other external candidates. At least one full EQA member should be included. The IBNC chair position may only be held by a full EQA member. The IQN Path Executive Director will also attend the IBNC meetings.

### The IBNC members appointed are:



Simon Patton  
(EMQN)



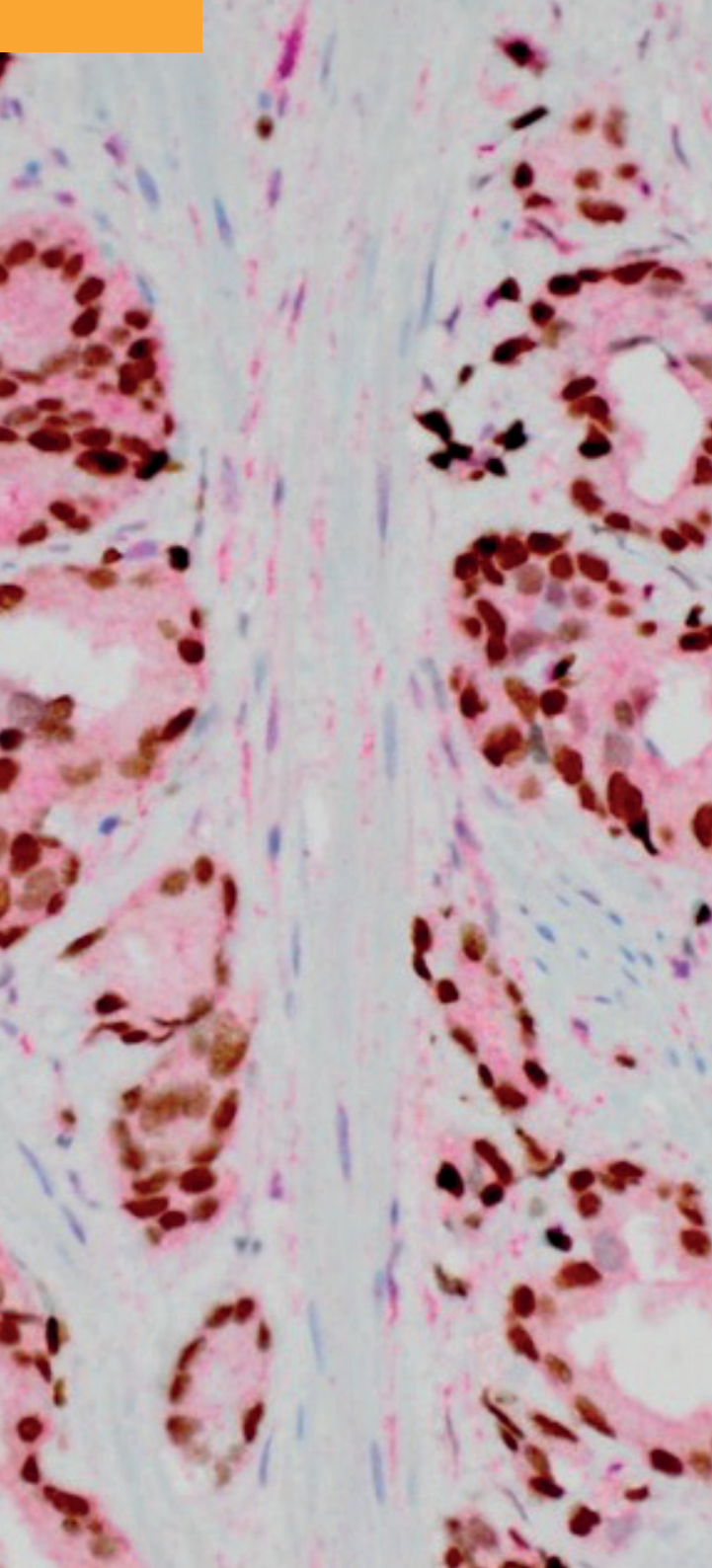
Barbara Farsheim  
(EBE)



Beth Sheppard  
(Roche)



# IQN Path Plans for 2018



## IQN Path Plans for 2018

The other IQN Path working groups will continue with their work:

- IHC – the IQN Path PD-L1 Educational Portal pilot and creating a fit-for-purpose EQA
- Liquid Biopsy - how to scale the cfDNA EQA and the publication of the 2017 cfDNA pilot and workshop guidance
- Molecular Pathology - publication of updated best practice guidelines for molecular EQA and the results from the survey of persistently poorly performing laboratories

New activities for the coming year include:

- The inception of a new working group on Tumour Molecular Burden (TMB), with the initial focus on the design of a suitable EQA
- The hosting of a workshop on the importance of reference materials for quality testing in cancer diagnostics
- Collaboration with the ESMO to develop a new one-and-a-half-day workshop on biomarkers for precision cancer therapy

These plans will be refined as the year progresses.

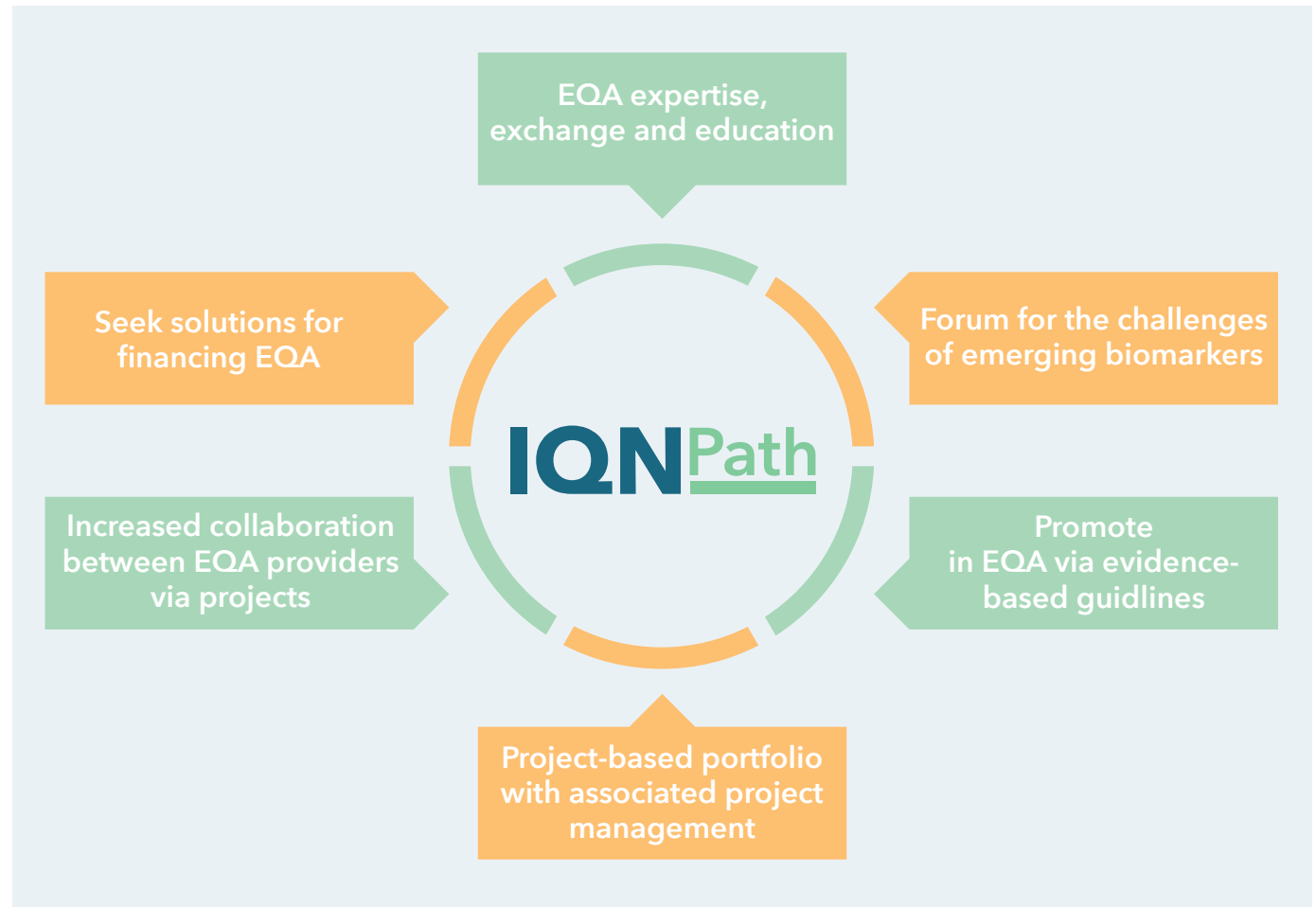
IQN Path welcomes new project proposals from the membership. Project proposals require submission to the Board for approval, using the IQN Path Project Form (available on website) and are subject to approval by the IQN Path Board.

## IQN Path strategy for the next 5 years

The current IQN Path Board has developed a strategic plan for the next 5 years. Six key areas for further development have been outlined and will be developed in greater detail by the next IQN Path Board, ensuring continuity of the objectives of IQN Path between consecutive Board appointments.

We welcome feedback from the membership on building this strategy for the years to come.

**Figure 5. Key principles to be developed for the 5-year strategy of IQN Path**



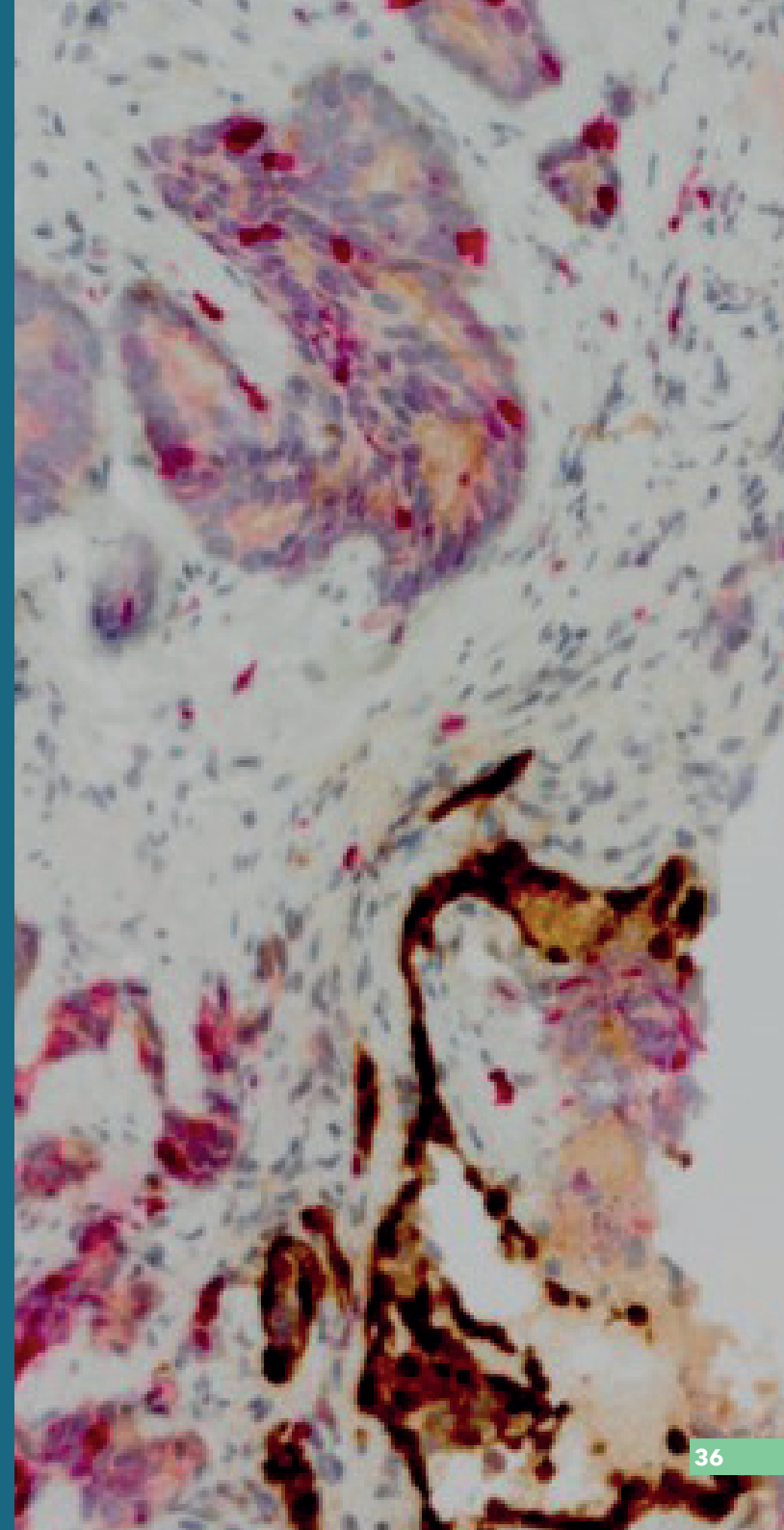
A decorative graphic on the left side of the slide, consisting of a network of white lines and dots on a light blue background. The lines connect various points, creating a complex, interconnected web-like structure. The dots are small and white, serving as nodes in the network. The overall effect is a modern, digital aesthetic.

# Publications by EQA Members



**As the importance of quality assured diagnostic testing becomes widely recognised, the field of EQA continues to grow.**

We are delighted that several of our member groups are joining IQN Path in the publication of journal papers. There is no doubt that publication helps raise the profile of EQA as well as providing valuable insights into the current status of laboratory testing. We hope that this list encourages IQN Path members to continue to actively pursue journal publication. If there is any assistance IQN Path can offer to promote the publication of EQA data, get in touch.



## Members in alphabetical order:

### AIOM/SIAPEC

Salvatore L, Aprile G, Arnoldi E, Aschele C, Carnaghi C, Cosimelli M, Maiello E, Normanno N, Sciallero S, Valvo F, Beretta GD. Management of metastatic colorectal cancer patients: guidelines of the Italian Medical Oncology Association (AIOM). *ESMO Open*. 2017 Apr 12;2(1):e000147.

Letovanec I, Finn S, Zygoura P, Smyth P, Soltermann A, Bubendorf L, Speel EJ, Marchetti A, Nonaka D, Monkhorst K, Hager H, Martorell M, Sejda A, Cheney R, Hernandez-Losa J, Verbeken E, Weder W, Savic S, Di Lorito A, Navarro A, Felip E, Warth A, Baas P, Meldgaard P, Blackhall F, Dingemans AM, Dienemann H, Dziadziuszko R, Vansteenkiste J, O'Brien C, Geiger T, Sherlock J, Schageman J, Dafni U, Kammler R, Kerr K, Thunnissen E, Stahel R, Peters S; ETOP Lungscape Consortium. Evaluation of NGS and RT-PCR methods for ALK rearrangement in European NSCLC patients: Results from the ETOP Lungscape Project. *J Thorac Oncol*. 2017 Nov 27. pii: S1556-0864(17)33063-0.

Normanno N, Fenizia F, Castiglione F, Barberis M, Taddei GL, Truini M, De Rosa G, Pinto C, Marchetti A. External quality assessment for *EGFR* mutations in Italy: improvements in performances over the time. *ESMO Open*. 2017 May 26;2(2):e000160.

### CAP

Bridge JA. Reverse transcription-polymerase chain reaction molecular testing of cytology specimens: Pre-analytic and analytic factors. *Cancer*. 2017 Jan;125(1):11-19.

Chiu JW, Krzyzanowska MK, Serra S, Knox JJ, Dhani NC, Mackay H, Hedley D, Moore M, Liu G, Burkes RL, Brezden-Masley C, Roehrl MH, Craddock KJ, Tsao MS, Zhang T, Yu C, Kamel-Reid S, Siu LL, Bedard PL, Chen EX. Molecular Profiling of Patients With Advanced Colorectal Cancer: Princess Margaret Cancer Centre Experience. *Clin Colorectal Cancer*. 2017 Oct 23. pii: S1533-0028(17)30150-0.

Fitzgibbons PL, Goldsmith JD, Souers RJ, Fatheree LA, Volmar KE, Stuart LN, Nowak JA, Astles JR, Nakhleh RE. Analytic Validation of Immunohistochemical Assays: A Comparison of Laboratory

Practices Before and After Introduction of an Evidence-Based Guideline. *Arch Pathol Lab Med*. 2017 Sep;141(9):1247-1254.

Graham RP, Treece AL, Lindeman NI, Vasalos P, Shan M, Jennings LJ, Rimm DL. Worldwide Frequency of Commonly Detected *EGFR* Mutations. *Arch Pathol Lab Med*. 2017 Nov 6.

Jennings LJ, Smith FA, Halling KC, Persons DL, Kamel-Reid S; Molecular Oncology Resource Committee of the College of American Pathologists. Design and analytic validation of BCR-ABL1 quantitative reverse transcription polymerase chain reaction assay for monitoring minimal residual disease. *Arch Pathol Lab Med*. 2012 Jan;136(1):33-40.

Jennings LJ, Arcila ME, Corless C, Kamel-Reid S, Lubin IM, Pfeifer J, Temple-Smolkin RL, Voelkerding KV, Nikiforova MN. Guidelines for Validation of Next-Generation Sequencing-Based Oncology Panels: A Joint Consensus Recommendation of the Association for Molecular Pathology and College of American Pathologists. *J Mol Diagn*. 2017 May;19(3):341-365.

Kis O, Kaedbey R, Chow S, Danesh A, Dowar M, Li T, Li Z, Liu J, Mansour M, Masih-Khan E, Zhang T, Bratman SV, Oza AM, Kamel-Reid S, Trudel S, Pugh TJ. Circulating tumour DNA sequence analysis as an alternative to multiple myeloma bone marrow aspirates. *Nat Commun*. 2017 May 11;8:15086.

Labbé C, Cabanero M, Korpanty GJ, Tomasini P, Doherty MK, Mascaux C, Jao K, Pitcher B, Wang R, Pintilie M, Leighl NB, Feld R, Liu G, Bradbury PA, Kamel-Reid S, Tsao MS, Shepherd FA. Prognostic and predictive effects of TP53 co-mutation in patients with *EGFR*-mutated non-small cell lung cancer (NSCLC). *Lung Cancer*. 2017 Sep;111:23-29.

Li MM, Datto M, Duncavage EJ, Kulkarni S, Lindeman NI, Roy S, Tsimberidou AM, Vnencak-Jones CL, Wolff DJ, Younes A, Nikiforova MN. Standards and Guidelines for the Interpretation and Reporting of Sequence Variants in Cancer: A Joint Consensus Recommendation of the Association for Molecular Pathology, American Society of Clinical Oncology, and College of American Pathologists. *J Mol Diagn*. 2017 Jan;19(1):4-23.

McCluggage WG, Judge MJ, Clarke BA, Davidson B, Gilks CB, Hollema H, Ledermann JA, Matias-Guiu X, Mikami Y, Stewart CJ, Vang R, Hirschowitz L; International Collaboration on Cancer Reporting. Data set for reporting of ovary, fallopian tube and primary peritoneal carcinoma: recommendations from the International Collaboration on Cancer Reporting (ICCR). *Mod Pathol*. 2015 Aug;28(8):1101-22.

Mehrotra M, Luthra R, Abraham R, Mishra BM, Virani S, Chen H, Routbort MJ, Patel KP, Medeiros LJ, Singh RR. Validation of quantitative PCR-based assays for detection of gene copy number aberrations in formalin-fixed, paraffin embedded solid tumor samples. *Cancer Genet*. 2017 Apr;212-213:24-31.

Mehrotra M, Singh RR, Chen W, Huang RSP, Almohammedsalim AA, Barkoh BA, Simien CM, Hernandez M, Behrens C, Patel KP, Routbort MJ, Broaddus RR, Medeiros LJ, Wistuba II, Kopetz S, Luthra R. Study of Preanalytic and Analytic Variables for Clinical Next-Generation Sequencing of Circulating Cell-Free Nucleic Acid. *J Mol Diagn*. 2017 Jul;19(4):514-524.

Nikiforova MN, Hsi ED, Brazier RM, Gulley ML, Leonard DG, Nowak JA, Tubbs RR, Vance GH, Van Deerlin VM; Molecular Pathology Resource Committee, College of American Pathologists. Detection of clonal IGH gene rearrangements: summary of molecular oncology surveys of the College of American Pathologists. *Arch Pathol Lab Med*. 2007 Feb;131(2):185-9.

Rimm DL, Han G, Taube JM, Yi ES, Bridge JA, Flieder DB, Homer R, West WW, Wu H, Roden AC, Fujimoto J, Yu H, Anders R, Kowalewski A, Rivard C, Rehman J, Batenchuk C, Burns V, Hirsch FR, Wistuba II. A Prospective, Multi-institutional, Pathologist-Based Assessment of 4 Immunohistochemistry Assays for PD-L1 Expression in Non-Small Cell Lung Cancer. *JAMA Oncol*. 2017 Aug 1;3(8):1051-1058.

Roy-Chowdhuri S, Chen H, Singh RR, Krishnamurthy S, Patel KP, Routbort MJ, Manekia J, Barkoh BA, Yao H, Sabir S, Broaddus RR, Medeiros LJ, Staerckel G, Stewart J, Luthra R. Concurrent fine needle aspirations and core needle biopsies: a comparative study of substrates for next-generation sequencing in solid organ malignancies. *Mod Pathol*. 2017 Apr;30(4):499-508.

Sepulveda AR, Hamilton SR, Allegra CJ, Grody W, Cushman-Vokoun AM, Funkhouser WK, Kopetz SE, Lieu C, Lindor NM, Minsky BD, Monzon FA, Sargent DJ, Singh VM, Willis J, Clark J, Colasacco C, Rumble RB, Temple-Smolkin R, Ventura CB, Nowak JA. Molecular Biomarkers for the Evaluation of Colorectal Cancer: Guideline From the American Society for Clinical Pathology, College of American Pathologists, Association for Molecular Pathology, and American Society of Clinical Oncology. *J Mol Diagn*. 2017 Mar;19(2):187-225.

Sepulveda AR, Hamilton SR, Allegra CJ, Grody W, Cushman-Vokoun AM, Funkhouser WK, Kopetz SE, Lieu C, Lindor NM, Minsky BD, Monzon FA, Sargent DJ, Singh VM, Willis J, Clark J, Colasacco C, Bryan Rumble R, Temple-Smolkin R, B Ventura C, Nowak JA. Molecular Biomarkers for the Evaluation of Colorectal Cancer: Guideline From the American Society for Clinical Pathology, College of American Pathologists, Association for Molecular Pathology, and American Society of Clinical Oncology. *Arch Pathol Lab Med*. 2017 May;141(5):625-657.

Sepulveda AR, Hamilton SR, Allegra CJ, Grody W, Cushman-Vokoun AM, Funkhouser WK, Kopetz SE, Lieu C, Lindor NM, Minsky BD, Monzon FA, Sargent DJ, Singh VM, Willis J, Clark J, Colasacco C, Rumble RB, Temple-Smolkin R, Ventura CB, Nowak JA. Molecular Biomarkers for the Evaluation of Colorectal Cancer: Guideline From the American Society for Clinical Pathology, College of American Pathologists, Association for Molecular Pathology, and the American Society of Clinical Oncology. *J Clin Oncol*. 2017 May 1;35(13):1453-1486.

Singh K1, Tantravahi U2, Lomme MM3, Pasquariello T4, Steinhoff M3, Sung CJ3. Updated 2013 College of American Pathologists/American Society of Clinical Oncology (CAP/ASCO) guideline recommendations for human epidermal growth factor receptor 2 (HER2) fluorescent in situ hybridization (FISH) testing increase HER2 positive and HER2 equivocal breast cancer cases; retrospective study of HER2 FISH results of 836 invasive breast cancers. *Breast Cancer Res Treat*. 2016 Jun;157(3):405-11.

Stuart LN, Volmar KE, Nowak JA, Fatheree LA, Souers RJ, Fitzgibbons PL, Goldsmith JD, Astles JR, Nakhleh RE. Analytic Validation of Immunohistochemistry Assays: New Benchmark Data From a Survey of 1085 Laboratories. *Arch Pathol Lab Med*. 2017 Sep;141(9):1255-1261.

Treece AL, Gulley ML, Vasalos P, Paquette C, Lindeman NI, Jennings LJ, Bartley AN. Reporting Results of Molecular Tests: A Retrospective Examination of *BRAF* Mutation Reporting. *Arch Pathol Lab Med*. 2017 May;141(5):658-665.

## CICO

Grosset AA, Loayza-Vega K, Adam Granger, Bridge M, Gilks B, Nguyen B, Soucy G, Tran-Thanh D, Albadine R, Trudel D. Hematoxylin and Eosin Counterstaining Protocol for Immunohistochemistry Interpretation and Diagnosis. *Appl Immunohistochem Mol Morphol*. 2017 Dec 21. [Epub ahead of print]

## EMQN

Haselmann V, Ahmad-Nejad P, Geilenkeuser WJ, Duda A, Gabor M, Eichner R, Patton S, Neumaier M. Results of the first external quality assessment scheme (EQA) for isolation and analysis of circulating tumour DNA (ctDNA) *Clin Chem Lab Med*. 2017 Aug 25.

## ESP QA

Tack V, Dufraing K, Deans ZC, van Krieken HJ, Dequeker EM. The ins and outs of molecular pathology reporting. *Virchows Arch*. 2017 Mar 26.

Dufraing K, Keppens C, Siebers A, Kafatos G, Lowe K, Demonty G, van Krieken H. (2017). Pre-analytical challenges during RAS testing: tissue quality and the estimation of tumour cell percentage. 29th European Congress of Pathology. Amsterdam, 2-6 Sep. 2017.

Keppens C, Deans Z, Patton S, Normanno N, Butler R, Cheetham M, Fairley J, Hall J, Schuurin E, Dequeker E. (2017). Results of the first European pilot external quality assessment scheme for the analysis of circulating tumour DNA. LKI symposium Liquid Biopsies & Cancer, Leuven, 28-30 August 2017. Received best poster award.

Keppens C, Dufraing K, Van Krieken H, Siebers A, Kafatos G, Lowe K, Demonty G, Dequeker E. (2017). Laboratory errors in the diagnostic process of RAS testing in Europe. 29th European congress of pathology. Amsterdam, 2-6 Sep. 2017.

't Hart N, Keppens C. (2017). Kwaliteitscontrole op Europese schaal. *Oncologie Up-to-date*, 5, 4-5.

Tack V, Dufraing K, Deans ZC, van Krieken HJ, Dequeker EM. The ins and outs of molecular pathology reporting. *Virchows Arch*. 2017 Mar 26.

## Gen&Tiss/ GFCO

Lhermitte B, Egele C, Weingertner N, Ambrosetti D, Dadone B, Kubiniek V, Burel-Vandenbos F, Coyne J, Michiels JF, Chenard MP, Rouleau E, Sabourin JC, Bellocq JP. Adequately defining tumor cell proportion in tissue samples for molecular testing improves interobserver reproducibility of its assessment. *Virchows Arch*. 2017 Jan;470(1):21-27.

## NordiQC

Vyberg M, Diernæs C, Røge R, Nielsen S; ISIMM-NordiQC Immunoassay Performance Assessment Series, No. 2. NordiQC Assessments of Low Molecular Weight Keratin 8/18 Immunoassays. *Appl Immunohistochem Mol Morphol*. 2017 Nov/Dec;25(10):673-678.

Røge R, Vyberg M, Nielsen S. Accurate PD-L1 Protocols for Non-Small Cell Lung Cancer can be Developed for Automated Staining Platforms With Clone 22C3. *Appl Immunohistochem Mol Morphol*. 2017 Jul;25(6):381-385.

Røge R, Nielsen S, Bzorek M, Vyberg M; ISIMM-NordiQC Immunoassay Performance Assessment Series, No. 1. NordiQC Assessments of SOX10 Immunoassays. *Appl Immunohistochem Mol Morphol*. 2017 Jul;25(6):377-380.

## RCPAQAP

Badrick TC, Gutscher A, Sakamoto N, Chin D. Diagnostic laboratories in Asia Pacific region: Investigation on quality characteristics and time of reporting. *Clin Biochem*. 2017 Jul;50(10-11):625-631.



Badrick T, Graham P. Can a combination of average of normals and "real time" External Quality Assurance replace Internal Quality Control? *Clin Chem Lab Med*. 2017 Sep 13. pii: /j/cclm.ahead-of-print/cclm-2017-0115/cclm-2017-0115.xml.

Ballard M, Jalikis F, Krings G, Schmidt RA, Chen YY, Rendi MH, Dintzis SM, Jensen KC, West RB, Sibley RK, Troxell ML, Allison KH. 'Non-classical' HER2 FISH results in breast cancer: a multi-institutional study. *Mod Pathol*. 2017 Feb;30(2):227-235.

Bonar R, Favaloro EJ, Adcock DM, Quality in coagulation and Haemostasis testing *Biochimica Medica*.2010;20(2):184-99.

Cummings MC, Greaves J, Shukor RA, Perkins G, Ross J. Technical proficiency in cytopathology: assessment through external quality assurance. *Cytopathology*. 2017 Apr;28(2):149-156.

Haffajee ZAM, Kumar B, Francis G, Peck M, Badrick T. The Royal College of Pathologists of Australasia Quality Assurance Program: Immunohistochemistry Breast Marker Audit Overview 2005-2015. *Appl Immunohistochem Mol Morphol*. 2017 Nov 20.

Jones GR, Koetsier S. Uptake of recommended common reference intervals for chemical pathology in Australia. *Ann Clin Biochem*. 2017 May;54(3):395-397.

Liu J, Tan CH, Badrick T, Loh TP. Moving standard deviation and moving sum of outliers as quality tools for monitoring analytical precision. *Clin Biochem*. 2017 Oct 26. pii: S0009-9120(17)30888-3.

Lopez JB, Jackson D, Gammie A, Badrick T. Reducing the Environmental Impact of Clinical Laboratories. *Clin Biochem Rev*. 2017 Feb;38(1):3-11.

Mackay M, Hegedus G, Badrick T. Assay Stability, the missing component of the Error Budget. *Clin Biochem*. 2017 Dec;50(18):1136-1144.

McCaughey EJ, Vecellio E1, Lake R, Li L, Burnett L, Cheshier D, Braye S, Mackay M, Gay S, Badrick T, Westbrook J, Georgiou A. Key factors influencing the incidence of hemolysis: A critical appraisal of current evidence. *Crit Rev Clin Lab Sci*. 2017 Jan;54(1):59-72.

Sioufi J, Badrick T, Sinclair L, Marsden K. Full Blood Count - Internal QC Protocol: a review by the Royal College of Pathologists of Australasia Quality Assurance Programs (RCPAQAP) Pty Ltd - Haematology. *Int J Lab Hematol*. 2017 Feb;39(1):84-94.

## UK NEQAS

Blackburn L, Luheshi L, Deans S, Kroese M, Burton H. Developing effective ctDNA testing services for lung cancer PHG Foundation Report (2017). <http://www.phgfoundation.org/report/developing-effective-ctdna-testing-services-for-lung-cancer>

Chitty LS. Recommended practice for laboratory reporting of non-invasive prenatal testing of trisomies 13,18 and 21; a consensus opinion. *Prenat Diagn*. 2017 Jul;37(7):699-704. Epub 2017 Jun 8.

Deans, ZC, Allen, S, Jenkins, L, Khawaja, F, Hastings, RJ, Mann, K, Patton, SJ, Siermans, EA, and Chitty, LS. (2017) Recommended practice for laboratory reporting of non-invasive prenatal testing of trisomies 13, 18 and 21: a consensus opinion. *Prenat Diagn*, 37: 699-704.

Deans ZC, Bilbe N, O'Sullivan B, Lazarou LP, de Castro DG, Parry S, Dodson A, Tanriere P, Clark C, Butler R. Improvement in the quality of molecular analysis of *EGFR* in non-small-cell lung cancer detected by three rounds of external quality assessment. *J Clin Pathol*. 2013 Apr;66(4):319-25.

Hochstenbach R, Slunga-Tallberg A, Devlin C, Florida G, de Alba MR, Bhola S, Rack K, Hastings R. Fading competency of cytogenetic diagnostic laboratories: the alarm bell has started to ring. *Eur J Hum Genet*. 2017 Feb;25(3):273-274.

Jenkins LA, Deans ZC, Lewis C, Allen S. Delivering an accredited non-invasive prenatal diagnosis service for monogenic disorders, and recommendations for best practice. *Prenat Diagn*. 2017 Dec 20. doi: 10.1002/pd.5197. [Epub ahead of print]

Richman SD *et al*. How close are we to standardised extended RAS gene mutation testing? The UK NEQAS evaluation. *J Clin Pathol*. 2017 Jan;70(1):58-62.

Richman SD, Fairley J, Butler R, Deans ZC.(2017) RAS screening in colorectal cancer: a comprehensive analysis of the results from the UK NEQAS colorectal cancer external quality assurance schemes (2009–2016) *Virchows Arch*. 2017 Dec;471(6):721-729.

Tack V, Dufraing K, Deans ZC, van Krieken HJ, Dequeker EM. The ins and outs of molecular pathology reporting. *Virchows Arch*. 2017 Mar 26.

Schoumans J, Suela J, Hastings R, Muehlematter D, Rack K, van den Berg E, Berna Beverloo H, Stevens-Kroef M. Guidelines for genomic array analysis in acquired haematological neoplastic disorders. *Genes Chromosomes Cancer*. 2016. May;55(5):480-91.

Stevens-Kroef M, Simons A, Rack K, Hastings RJ. Cytogenetic Nomenclature and Reporting. *Methods Mol Biol*. 2017;1541:303-309.

Tack V, Dufraing K, Deans ZC, van Krieken HJ, Dequeker EM. The ins and outs of molecular pathology reporting. *Virchows Arch*. 2017 Mar 26.

## Other publications of interest

### QuIP®

Fassunke J, Ihle MA, Lenze D, Lehmann A, Hummel M, Vollbrecht C, Penzel R, Volckmar AL, Stenzinger A, Endris V, Jung A, Lehmann U, Zeugner S, Baretton G, Kreipe H, Schirmacher P, Kirchner T, Dietel M, Büttner R, Merkelbach-Bruse S. *EGFR* T790M mutation testing of non-small cell lung cancer tissue and blood samples artificially spiked with circulating cell-free tumor DNA: results of a round robin trial. *Virchows Arch*. 2017 Oct;471(4):509-520.

Joint position paper of the Federal Association of German Pathologists and the German Society of Pathology for a centralized, possibly industry-based service provision in multigenetic analyzes in tumor diagnostics.

Petersen I, Dietel M, Geilenkeuser WJ, Mireskandari M, Weichert W, Steiger K, Scheel AH, Büttner R, Schirmacher P, Warth A, Lasitschka F, Schildhaus HU, Kirchner T, Reu S, Kreipe H, Länger F,

Tiemann M, Schulte C, Jöhrens K. *EGFR* immunohistochemistry as biomarker for antibody-based therapy of squamous NSCLC - Experience from the first ring trial of the German Quality Assurance Initiative for Pathology (QuIP®). *Pathol Res Pract*. 2017 Dec;213(12):1530-1535.

Volckmar AL, Sültmann H, Riediger A, Fioretos T, Schirmacher P, Endris V, Stenzinger A, Dietz S. A field guide for cancer diagnostics using cell-free DNA: From principles to practice and clinical applications. *Genes Chromosomes Cancer*. 2017 Dec 5.

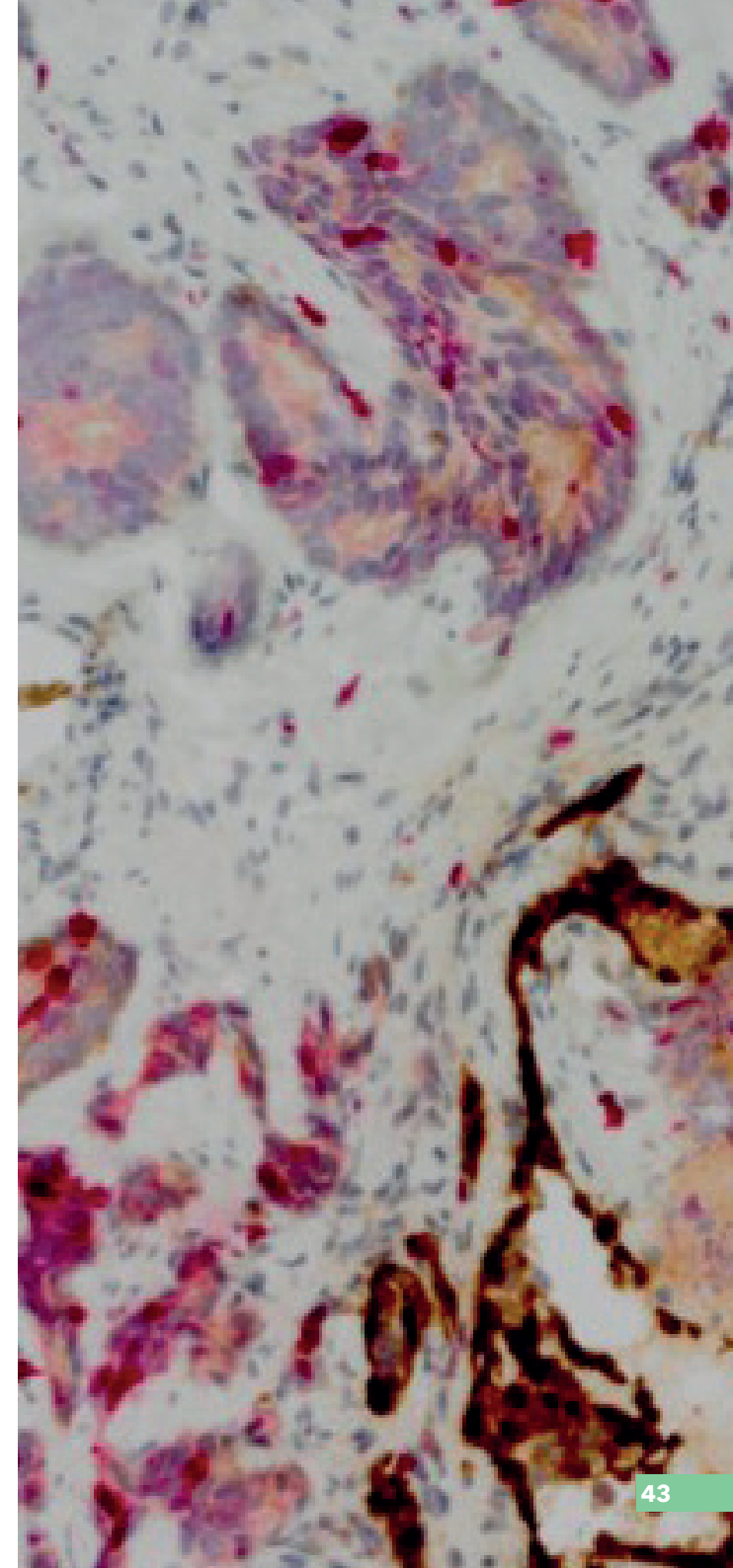
## NIBSC

Sanzone P, Hawkins R, Atkinson E, Rigsby P, Boyle J, National Institute for Biological Standards and Control (NIBSC) Expert committee on biological standardization Geneva, 17-20 Oct. 2017. Collaborative study to evaluate the proposed WHO 1st International Reference Panel for genomic *KRAS* codons 12 and 13 mutations.

[http://www.who.int/biologicals/expert\\_committee/BS2317\\_KRAS\\_WHO\\_reference\\_panel\\_WHO\\_BS\\_2017.pdf](http://www.who.int/biologicals/expert_committee/BS2317_KRAS_WHO_reference_panel_WHO_BS_2017.pdf)

## ISO Guidelines on pre-analytics due in 2018

During 2017, some IQN Path members have been involved in the preparation of ISO guidelines for *in-vitro* diagnostic examinations. ISO specifications for pre-examination processes for formalin-fixed and paraffin-embedded (FFPE) tissue will be published in 2018. We will keep the membership updated when these are released.



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# Appendix

# Appendix 1: The 6th Meeting on External Quality Assessment in Molecular Pathology

**Aiom** **SIAPEC-IAP** **ESMO** **ESP**  
 Associazione Italiana di Oncologia GOOD SCIENCE BETTER MEDICINE BEST PRACTICE European Society for Medical Oncology Quality Assessment Program

**6<sup>TH</sup> MEETING ON  
 EXTERNAL QUALITY ASSESSMENT  
 IN MOLECULAR PATHOLOGY**

Hotel Mediterraneo  
 Naples, May 12-13, 2017

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# PROGRAM

FRIDAY, MAY 12



Chairs: H. van Krieken and N. Normanno

09.00	Welcome and Opening <i>A. Bianchi, G. Botti, F. Ciardiello, V. Fascione, C. Pinto, M. Truini</i>
09.30 - 11.00	<b>Joint ESMO-AIOM-IQN Path session</b> Cancer immunotherapy: from basics to clinical practice and sustainability <i>Chairs: F. Ciardiello, H. van Krieken, C. Pinto</i> <i>The aim of this session is to revisit the basic mechanisms of anti-tumor immune response, to highlight the rationale for the use of checkpoint inhibitors in cancer therapy and summarize the state of the art of the development of immunotherapy of cancer.</i>
09.30 - 09.55	Immunocheckpoint inhibitors in cancer: rational and mechanism of action ( <i>J. Haanen</i> )
09.55 - 10.20	Overview of clinical development of checkpoint inhibitors ( <i>J. Bennouna</i> )
10.20 - 10.45	Sustainability of checkpoint inhibitors for the health system ( <i>L. Mantovani</i> )
10.45 - 11.00	Discussion
11.00 - 11.15	Coffee break
11.15 - 13.00	<b>Challenges in the assessment of PD-L1</b> <i>Chairs: A. Marchetti, K. Miller, H. van Krieken</i> <i>The aim of this session is to discuss the challenges for the determination of PD-L1 and to present results of national and international initiatives and EQA schemes to improve PD-L1 assessment in clinical practice.</i>
11.15 - 12.00	Harmonization and EQA programs for PD-L1 assessment in Europe. Experience from: <ul style="list-style-type: none"><li>• Italy (<i>A. Marchetti</i>)</li><li>• Germany (<i>P. Schirmacher</i>)</li><li>• France (<i>M.P. Chenard</i>)</li><li>• CIQC (<i>J. Garrat</i>)</li><li>• The European Society of Pathology initiative (<i>N.A. 't Hart</i>)</li></ul>
12.00 - 12.20	EQA for PD-L1 IHC staining: is it a conundrum? ( <i>K. Miller</i> )
12.20 - 13.00	Discussion
13.00 - 14.00	Lunch

**14.00 - 15.30** **Liquid biopsy in the clinic: current status and future developments**  
*Chairs: S. Deans, E. Dequeker, N. Normanno*  
*In this session the current status of development of liquid biopsies for clinical applications, the problems related to the standardization of the procedures and the preliminary results of EQA on liquid biopsy will be discussed.*

14.00 - 14.20	The clinical lab pathway from blood collection to reporting ( <i>P. Pauwels</i> )
14.20 - 14.40	Current and future clinical applications of liquid biopsy ( <i>M. Garassino</i> )
14.40 - 15.00	Results of the joint pilot EQA scheme and next steps ( <i>S. Deans</i> )
15.00 - 15.30	Discussion

**15.30 - 17.00** **New technologies come to the clinic**  
*Chairs: N. Normanno, S. Gori*

- Roche
- Qiagen
- Sysmex
- Thermo Fisher
- Biocartis
- Illumina

17.00 - 17.15 Tea break

**17.15 - 18.30** **General Meeting IQN Path** (*open to all IQN Path members*)

SATURDAY, MAY 13

**09.00 - 11.30** **Next generation sequencing technologies in the clinic**  
*Chairs: M. Dietel, N. Normanno, E. Rouleau*  
*In this session the current status of introduction of high throughput technologies in the clinic and the performance of these new technologies in EQA schemes will be discussed.*

09.00 - 09.20	The position of the pharmaceutical industry EBE-EFPIA on NGS in the clinic ( <i>C. Dollins</i> )
09.20 - 09.40	The French initiative in molecular pathology ( <i>E. Rouleau</i> )
09.40 - 10.00	The current status of NGS in clinical practice ( <i>M. Dietel</i> )
10.00 - 10.20	The performance of NGS in EQA ( <i>V. Tack</i> )
10.20 - 10.40	The results of the Italian colon and melanoma EQA scheme ( <i>F. Fenizia</i> )
10.40 - 11.20	Discussion
11.20 - 11.40	Coffee break

**11.40 - 13.00** **Restricted meeting of IQN Path academic members**

13.00 - 14.00 Lunch

# Appendix 2: Florence ctDNA workshop agenda

Workshop Gold Sponsors:




Sponsored Talks:

**IQNPath**

**ctDNA Workshop**

From Sample collection to clinical integration of the results - ensuring quality end to end


Date: 23 June 2017  
 Venue: Hotel Albani Firenze,  
 12 Via Fiume, 50100 Florence, Italy



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ctDNA Pilot Sponsors:



**About IQN PATH**

IQN Path is an international, not-for-profit organisation that was started in November 2015. The mission of IQN Path is to improve the process of implementation of biomarker testing in pathology and ensure high quality testing is delivered to physicians for the benefit of patients. IQN Path provides a platform to improve the process of adoption of new biomarker testing in pathology into routine clinical testing.

As an association, IQN Path brings together key stakeholders involved in quality implementation of biomarker testing, including External Quality Assessment (EQA) providers, laboratories, other affiliated not-for-profit or academic organisations and standards agencies, pharmaceutical companies, diagnostics and technology companies who manufacture diagnostic kits and equipment and producers of reference materials used in EQA.

IQN Path conducts its activities through promoting expertise in EQA and EQA design, fostering awareness on the importance of quality of testing and supporting education. For more information please see [www.iqnpath.org](http://www.iqnpath.org)



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## Abstract

The use of ctDNA as a clinical diagnostic tool is becoming increasingly important with the continuing implementation of targeted therapies in solid tumours. Minimally-invasive molecular analysis by sampling of ctDNA has now been validated as a suitable alternative to tissue sampling. ctDNA is shed from tumours into the circulation in small amounts, and may be detected by highly sensitive molecular technologies. A research technology for many years, this technique has now been demonstrated to have clinical diagnostic utility for patients with solid tumours. Applications are currently focussed on the detection of primary mutations to inform treatment, and the subsequent detection of resistant mutations in longitudinal samples.

The programme for IQN Path ctDNA workshop will cover ctDNA sampling methods and logistics, highly sensitive molecular technologies for the analysis of ctDNA, the interpretation of results, and clinical reporting. The results of an IQN Path pilot EQA scheme for ctDNA will also be discussed, and an open discussion session will be held to further the development of best-practice guidelines for laboratories already providing or intending to provide this service.

## Agenda

Session 1 Chair - Nicola Normanno		
09.00	Welcome address	Jacqueline Hall (IQN Path)
09.10 - 09.40	Liquid biopsy: Definition and biology behind	Rachel Butler (Cardiff)
09.40 - 10.00	Blood drawing: collection tubes, preparation and storage of plasma	Davina Gale (Inivata)
10.00 - 10.20	ctDNA extraction methods	Ed Schuurin (Gronigen)
10.20 - 10.50	Refreshment Break	

Session 2 Chair - Marc Denis		
10.50 - 11.10	Methodologies for ctDNA testing	Marc Denis (Nantes)
11.10 - 11.30	Current clinical applications of liquid biopsy	Nicola Normanno (Naples)
Sponsors session 1		
11.50 - 12.35	<ul style="list-style-type: none"> <li>Idylla™: easy, rapid and accurate molecular testing for every patient (Biocartis)</li> </ul>	Bart Jacobs
	<ul style="list-style-type: none"> <li>Seracare</li> </ul>	Ruth Mayes
	<ul style="list-style-type: none"> <li>Importance of ccfDNA and Extraction for Liquid Biopsy Applications (Qiagen)</li> </ul>	Martin Schlumpberger
12.35 - 13.15	Lunch	
Session 3 Chair - Simon Patton		
13.15 - 13.35	Why quality is important	Els Dequeker (Leuven)
13.35 - 13.55	Summary of IQN Path pilot EQA	Sandi Deans (Edinburgh)
Sponsors session 2		
13.55 - 14.20	<ul style="list-style-type: none"> <li>Advancing Liquid Biopsy with NGS Solutions (ThermoFisher Scientific)</li> </ul>	Thomas Bittick
	<ul style="list-style-type: none"> <li>Evaluation of the performance of circulating tumor DNA sequencing panels (Horizon)</li> </ul>	Jonathan Frampton
14.20 - 14.40	Refreshment Break	
Session 4 Chairs - Sandi Deans and Els Dequeker		
14.40 - 17.00	Open discussion on standards for ctDNA plasma testing and reporting	All
17.00	Close of meeting	

## Vision

**IQN Path** is an international multi-stakeholder expert group focused on improving quality of clinical biomarker testing. **IQN Path** brings together organisations and key stakeholders involved in quality implementation of biomarker testing in pathology with the aim to deliver high quality patient care.

## Mission

To improve the process of implementation of biomarker testing in pathology and ensure high quality testing is delivered to physicians for the benefit of patients. **IQN Path** conducts its activities through promoting expertise in EQA and EQA design, fostering awareness on the importance of quality of testing and supporting education. **IQN Path** is an international, not-for-profit organisation, registered in November 2015.

[www.iqnpath.org](http://www.iqnpath.org)



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