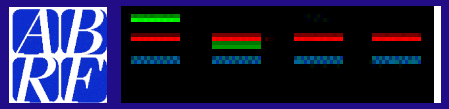
Fragment Analysis Research Group 2003 Study

Current Trends in the Resource Facility Providing Genetic Variability Analysis



Fragment Analysis Research Group

2002 Fragment Analysis Research Group

● Doug Bintzler, Chair	University of Cincinnati
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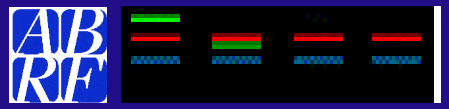
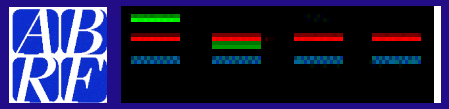
● Lynn Petukhova	The Rockefeller University
● Caprice Rosato (in-coming Chair)	Oregon State University
● Bob Keefe	Wadsworth Center/ NYS DOH
● Rebecca Scholl	University of Utah
● Katia Sol-Church	Alfred I. duPont Hospital for Children
● Pamela Scott Adams	Trudeau Institute



Presentation

1. Study Design
2. Goals and Purpose
3. 1999 and 2003 Study Data
4. Conclusion
5. Round Table Discussion

A brief outline of the study and presentation will include a brief discussion about the design and purpose of the study, what the purpose for the study was. We also will try to compare some of the data from this study with the study presented during the 1999 conference. However, because of the changes that have taken place during the past four years, not every piece of data will be compared. Finally, a few conclusions about the study.

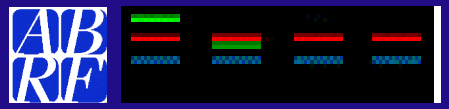


Purpose and Goals

1. To determine what services are provided in the Resource Facility Today

2. To diagnose how fragment analysis services have changed

3. To provide a medium or resource for self comparison and education



Study Response

1999

- The 1999 study was conducted in 1998 and reported at the ABRF 1999

- 20 responses

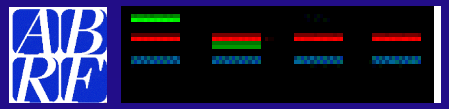
2003

- This study was conducted in 2002

- 34 Responses

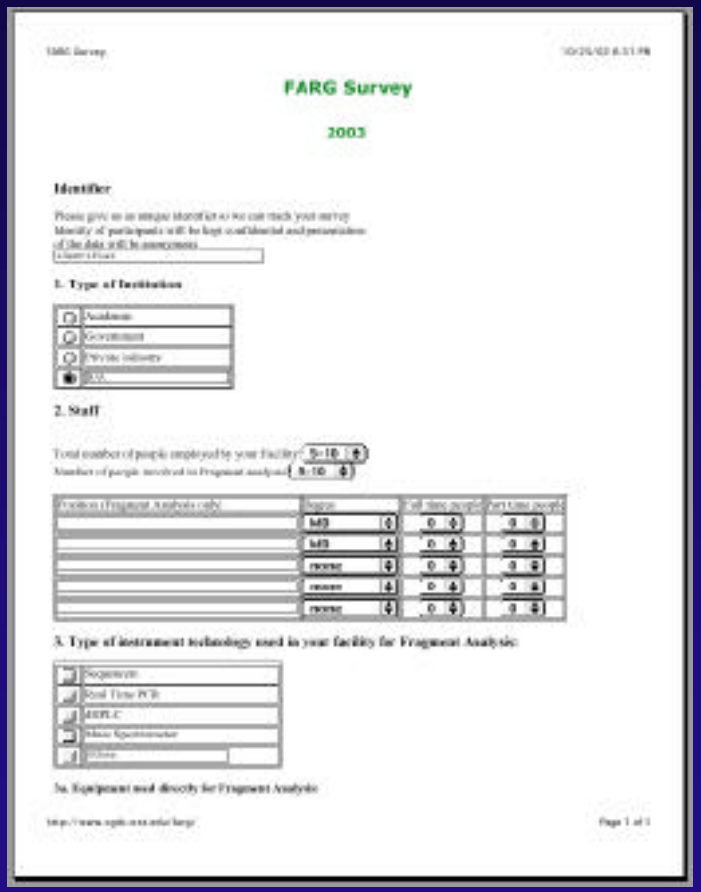
Before starting, it is important to clarify that the 1999 study was presented during the 1999 conference but was conducted during 1998. This study was directed to individuals working in a fragment analysis facility and had 20 participating responses.

The 2003 study was conducted at the end of 2002. Because of the wording of the questions on the study, this study was more directed to a fragment analysis facility as a whole. There were 34 responses showing a 70 % increase from 1999.



The study was conducted as an on-line survey. The survey included questions related to the types of services provided in the facility, the types of equipment used and the personnel who do the work.

Study Design


FARG Survey

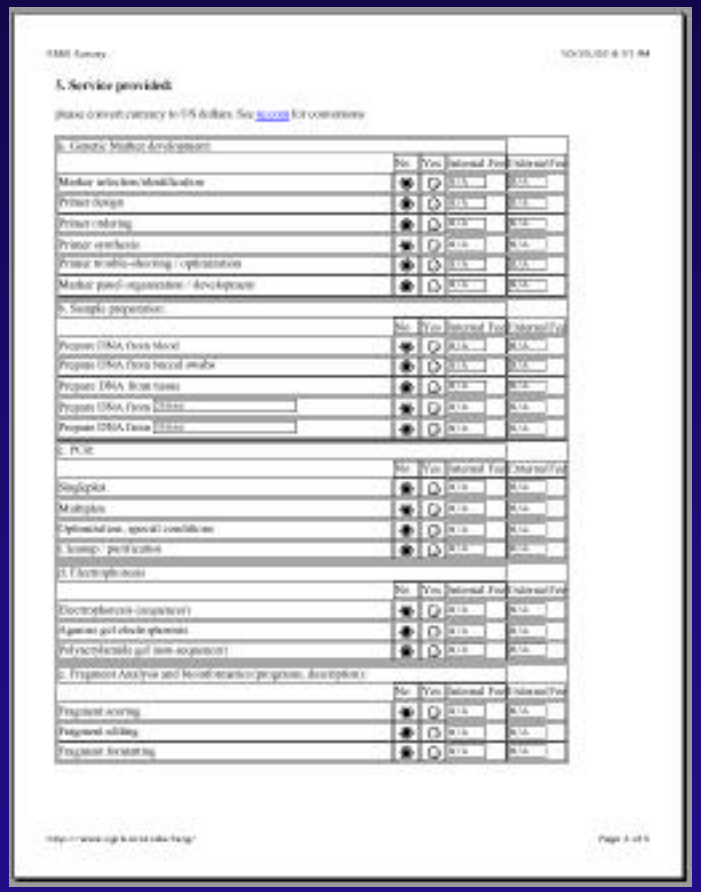
2003

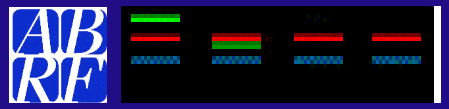
Identifier

1. Type of Institution

2. Staff

3. Type of instrument technology used in your facility for Fragment Analysis:


5. Service provided:



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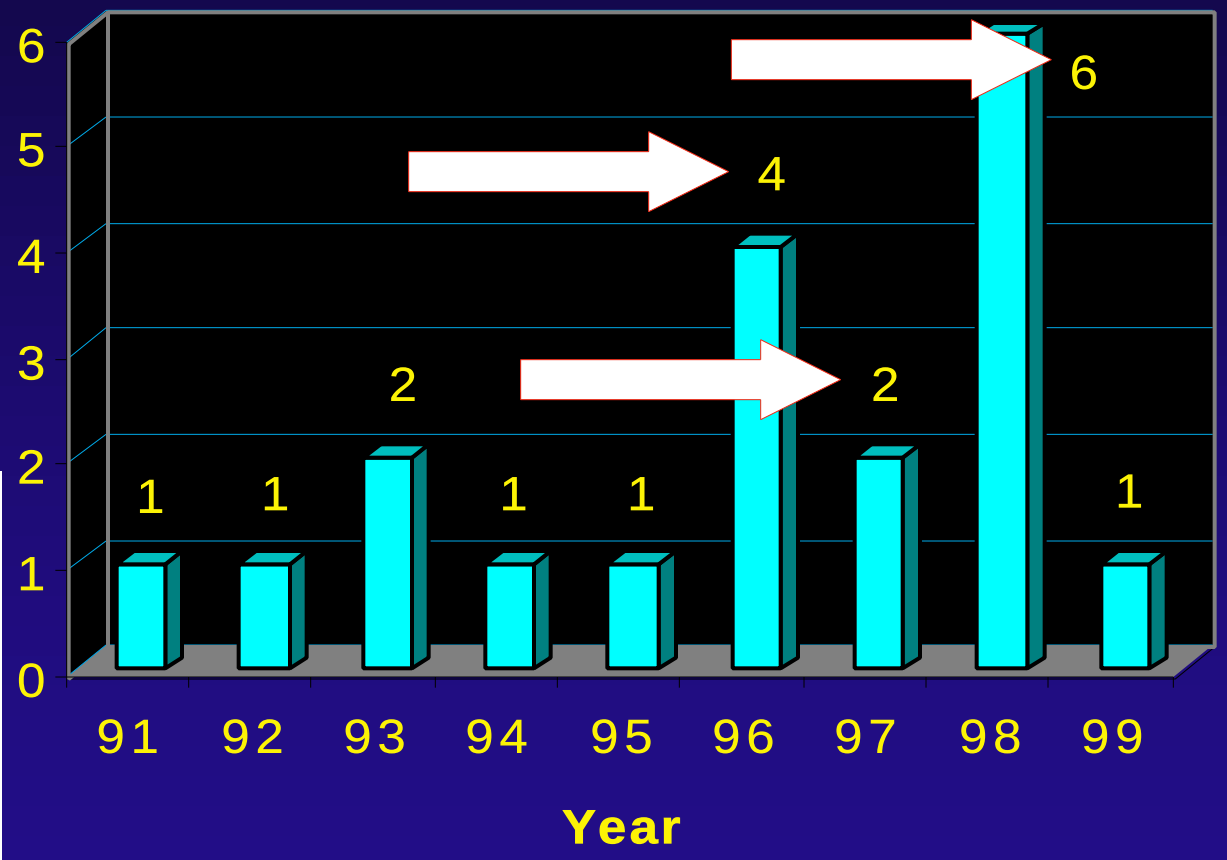
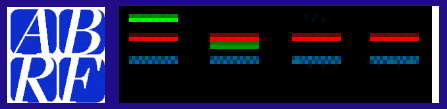
Beginning Fragment Analysis Service 1999 Study



During the study conducted in 1999, It was observed that fragment analysis was a relatively new service provided in the resource facility. In fact, 12 of the 20 facilities that participated in the study had been conducting fragment analysis for 3 years.



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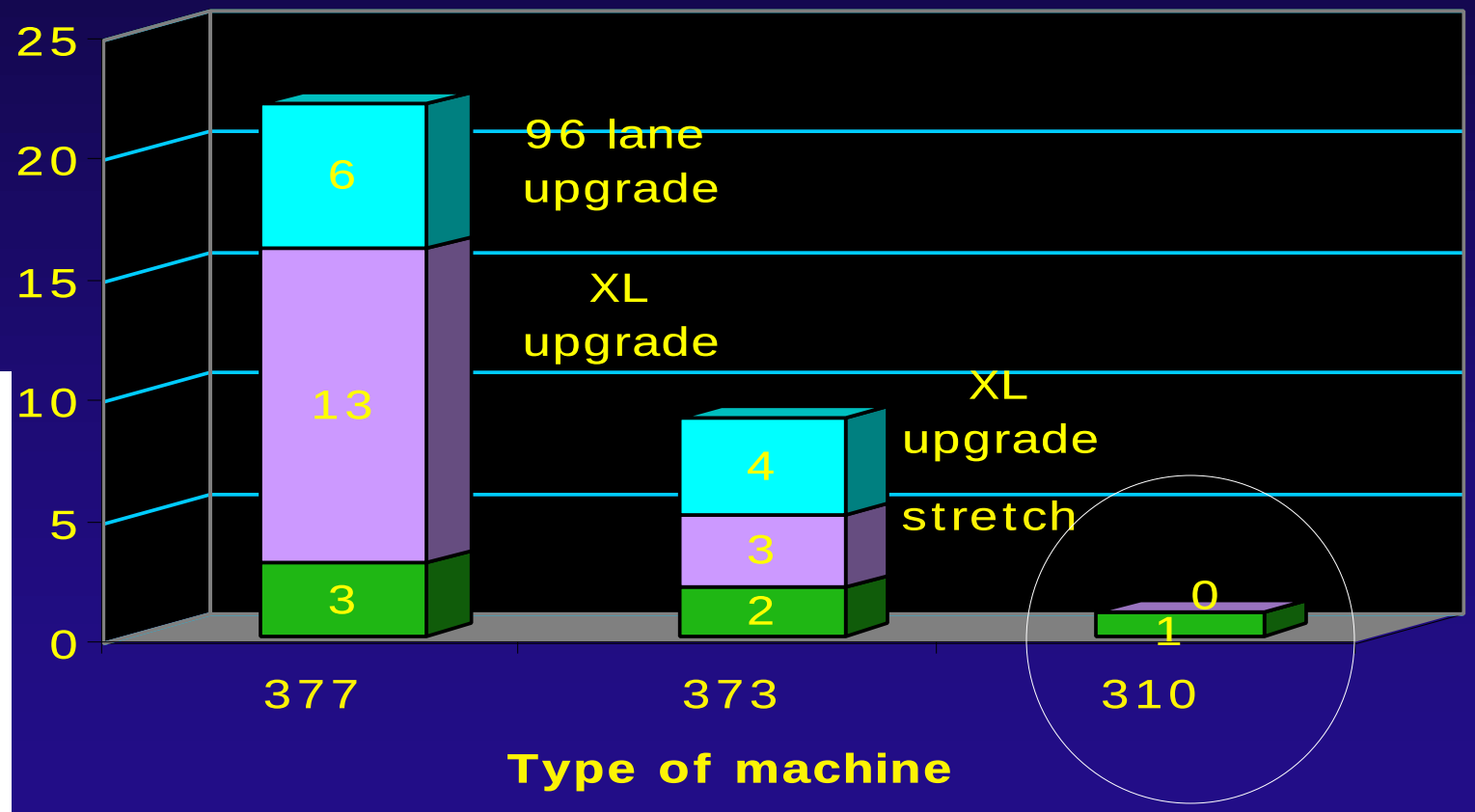
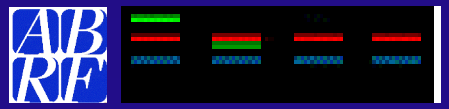
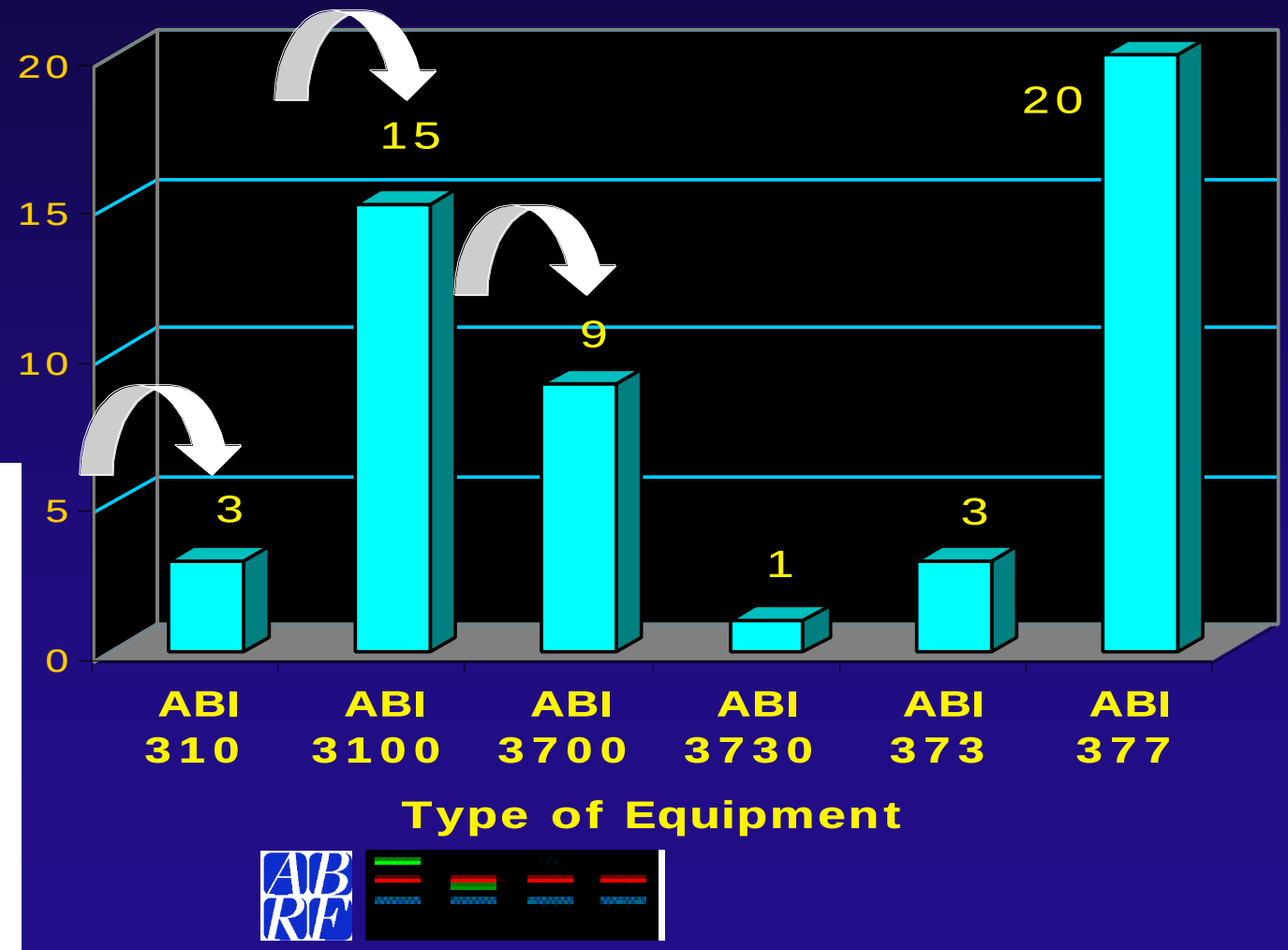
Types of Equipment Used 1999



The slab gel sequencers also dominiated in the fragment analysis services. Only one facility was using a capillary sequencer for fragment analysis. Of course, certain capillary machines were not yet available. The ABI 3700 was just entering the market, the ABI 3100 was not available and other machines like the Beckman CEQ was also new.



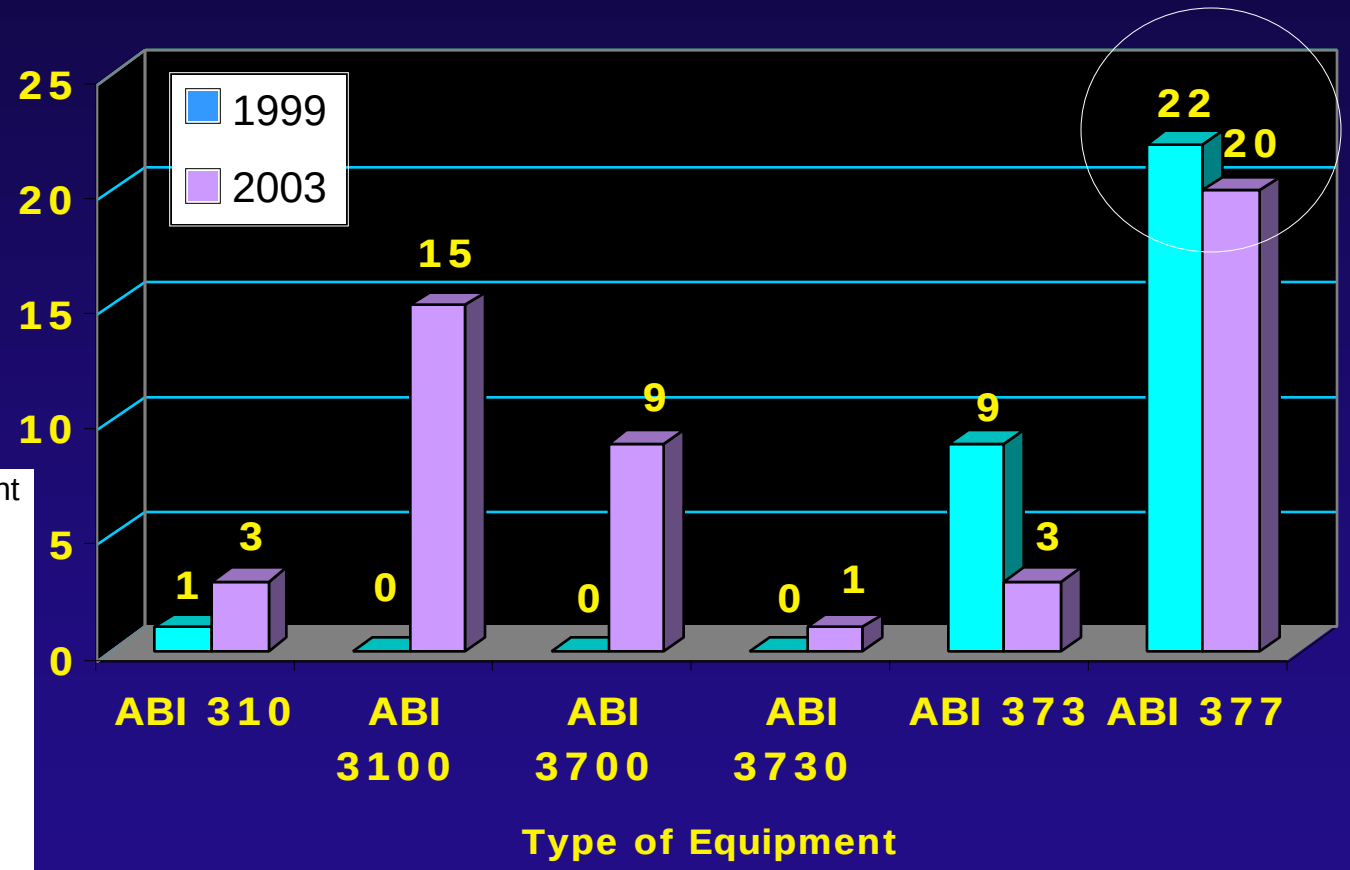
Types of Equipment Used 2003



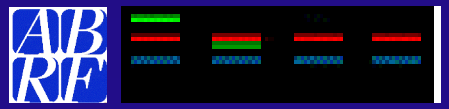
Now the capillary machines have become a more dominant force in fragment analysis studies. There also was an increase use in the single capillary ABI 310. The most utilized capillary machine is a newer model the 16 capillary ABI 3100.

It is also important to note that the slab gel machines are still widely used and the ABI 377 is the most used by the participants of the study.

Equipment Used 1999 vs 2003



By comparing the equipment used up to 1998 and used now, we see that the capillary sequencers are used in a majority of the resource facilities. And, there was little surprise to see the ABI 373 slab gel system drop although it is still in use. But there was some surprise that the ABI 377 slab gel system is used in almost as many laboratories now as in 1998.



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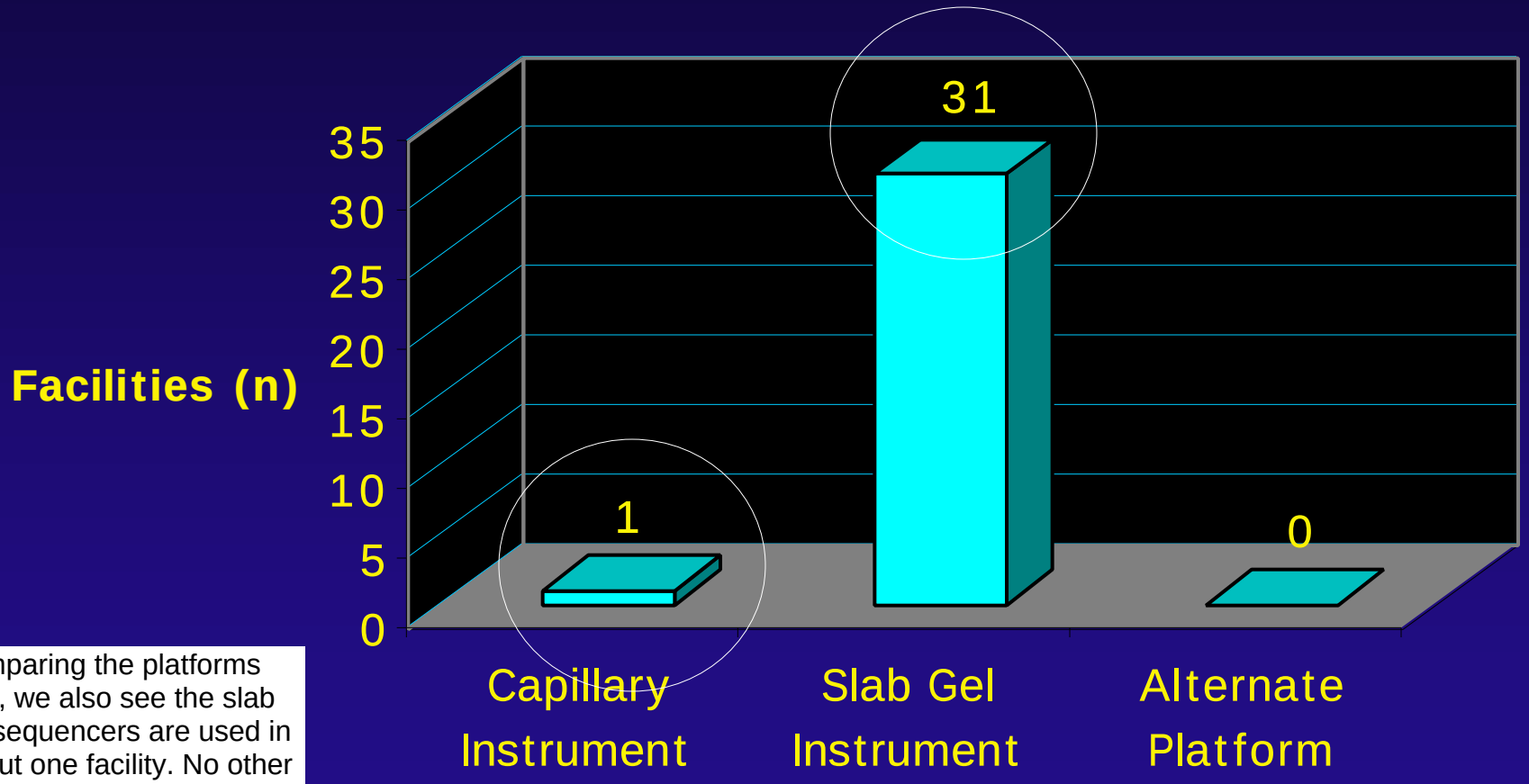
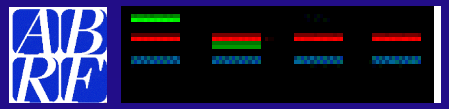
Platform 1999



Comparing the platforms only, we also see the slab gel sequencers are used in all but one facility. No other platforms were listed by the participants in the study.



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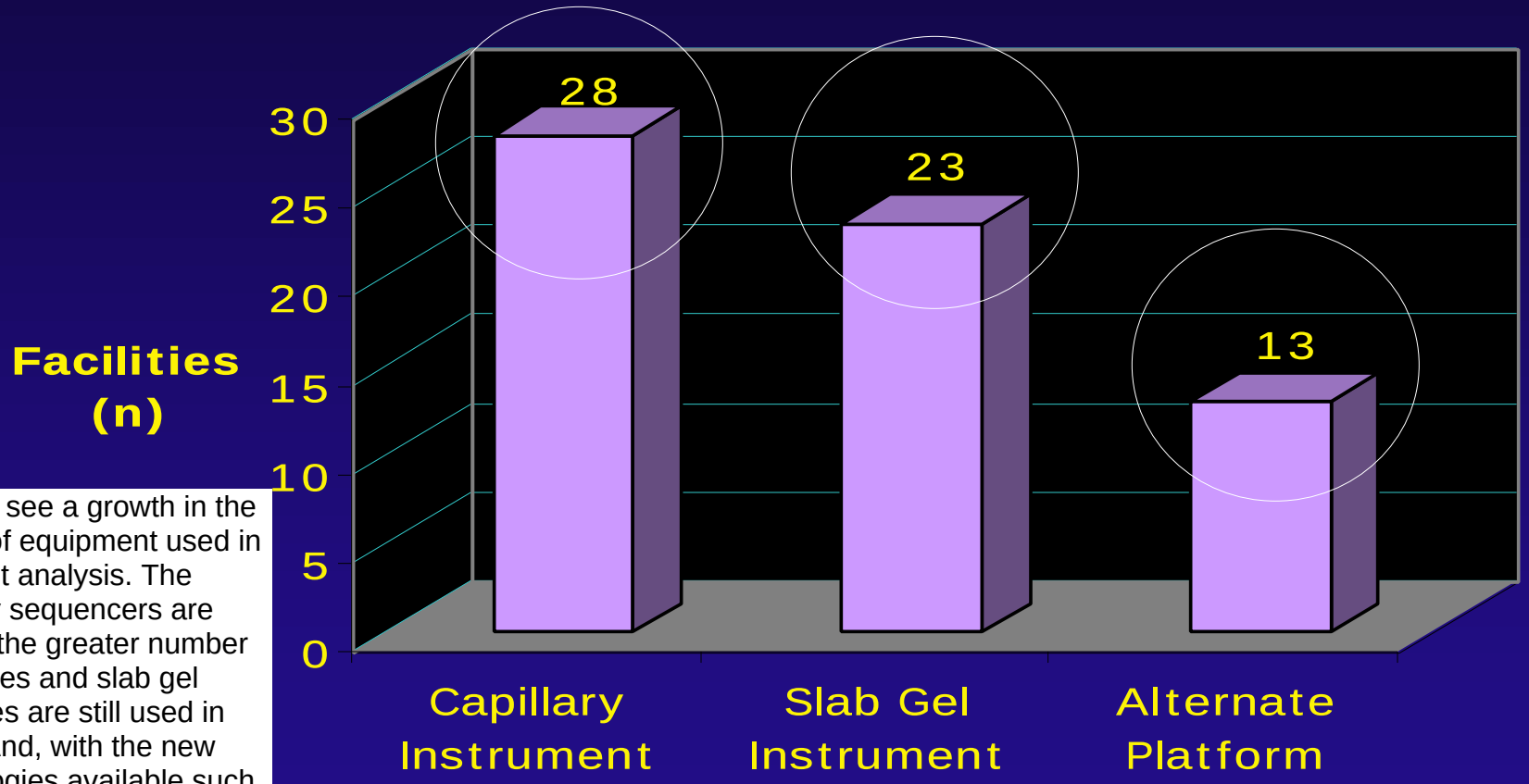
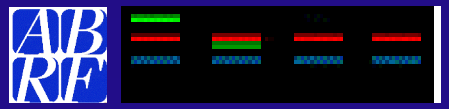
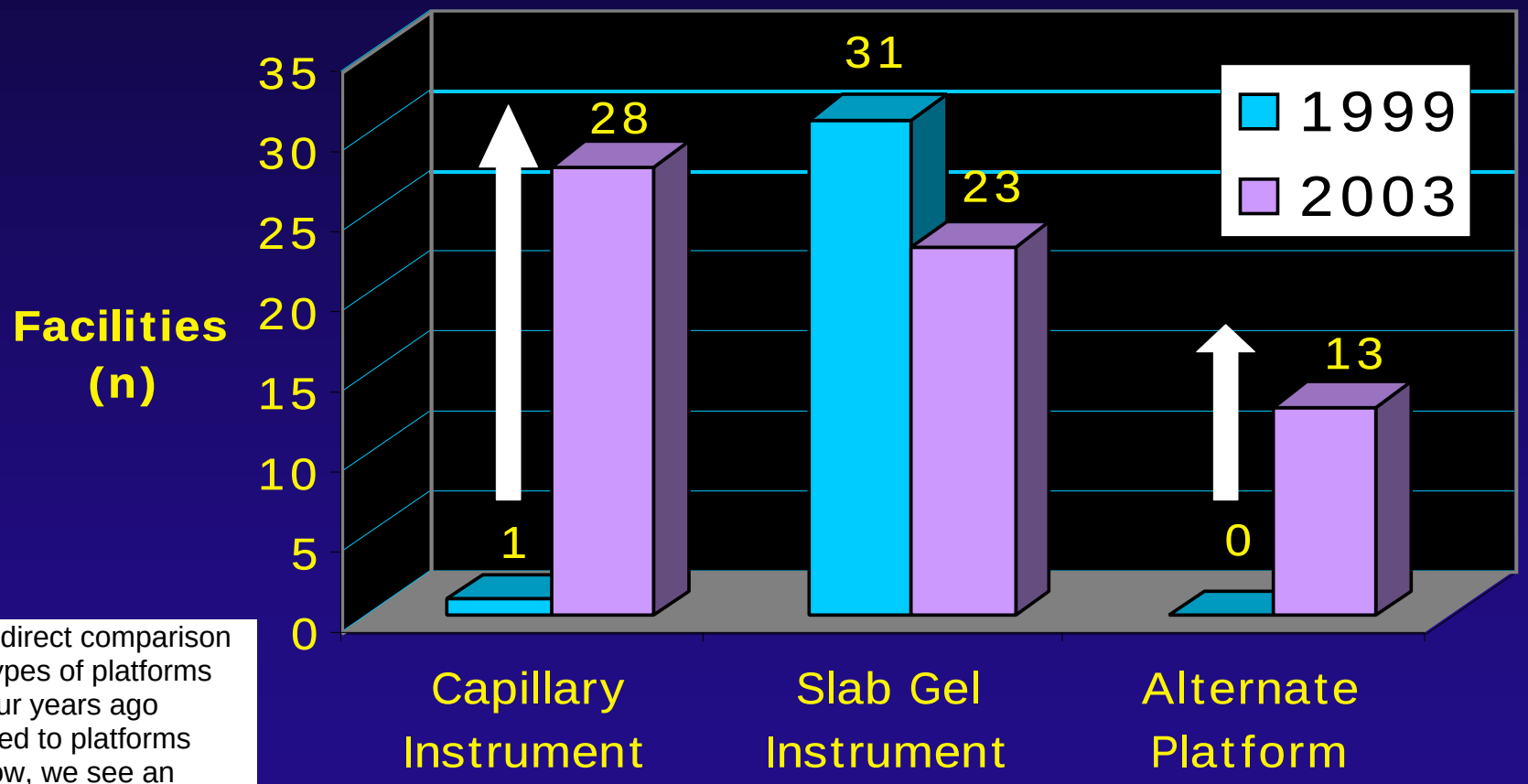
Platform 2003



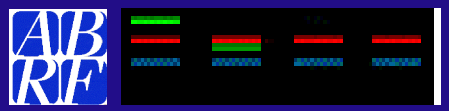
Now we see a growth in the pieces of equipment used in fragment analysis. The capillary sequencers are used in the greater number of facilities and slab gel machines are still used in many. And, with the new technologies available such as real time PCR, there are alternative methods also used.



Platform 1999 VS 2003



From a direct comparison of the types of platforms used four years ago compared to platforms used now, we see an increase in the capillary machines and the alternative platforms.



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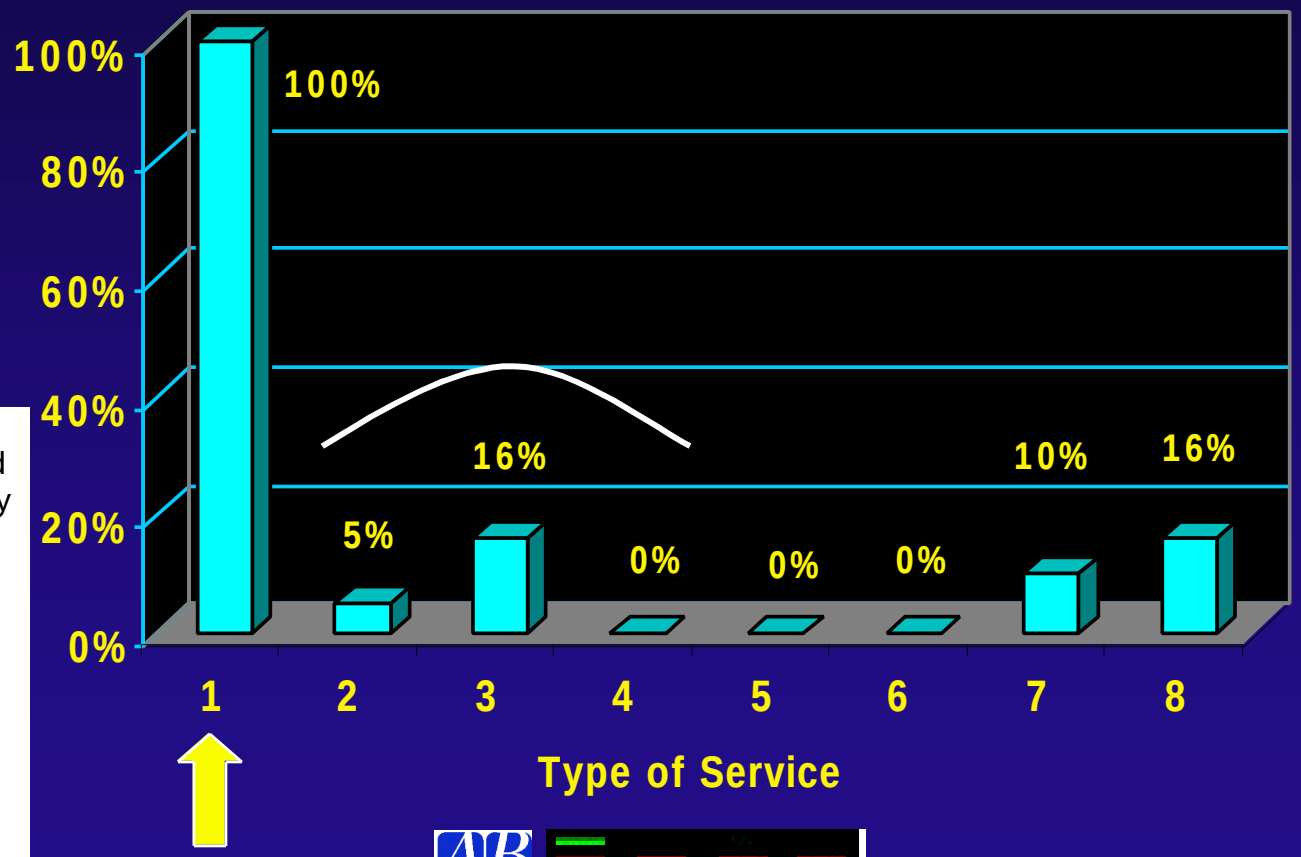
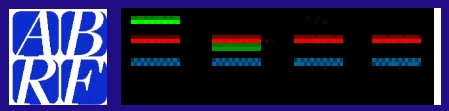
Profile of Genotyping Services 1999



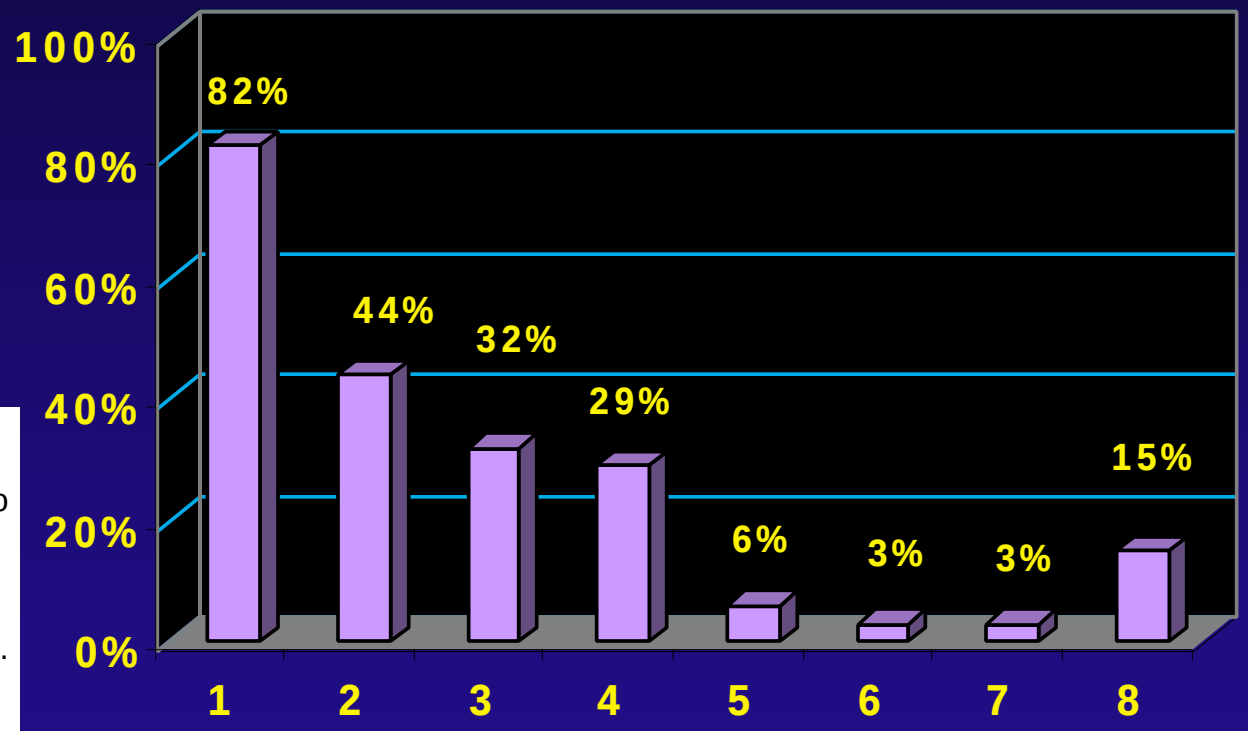
1. STRs
2. SNP
3. AFLP
4. RFLP
5. ISSR
6. DiffDis
7. SSCP
8. Other

The types of fragments analyzed in 1999 were mostly single tandom repeats or STRs. Fragment applications also included SNP detection, AFLP, SSCP and RFLP. However, the other applications were only performed in a few facilities.



Fragment Analysis Research Group

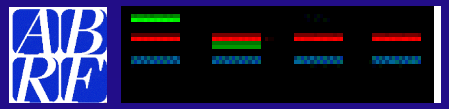
Profile of Genotyping Services 2003



1. STRs
2. SNP
3. AFLP
4. RFLP
5. ISSR
6. DiffDis
7. SSCP
8. Other

Facilities (%)

There was a tremendous change 4 years later according to our study. Detection of single tandem repeats is still performed in the majority of the facilities. We also see an increase in SNP detection, RFLP and AFLP. Methods used to compare sequences are growing.



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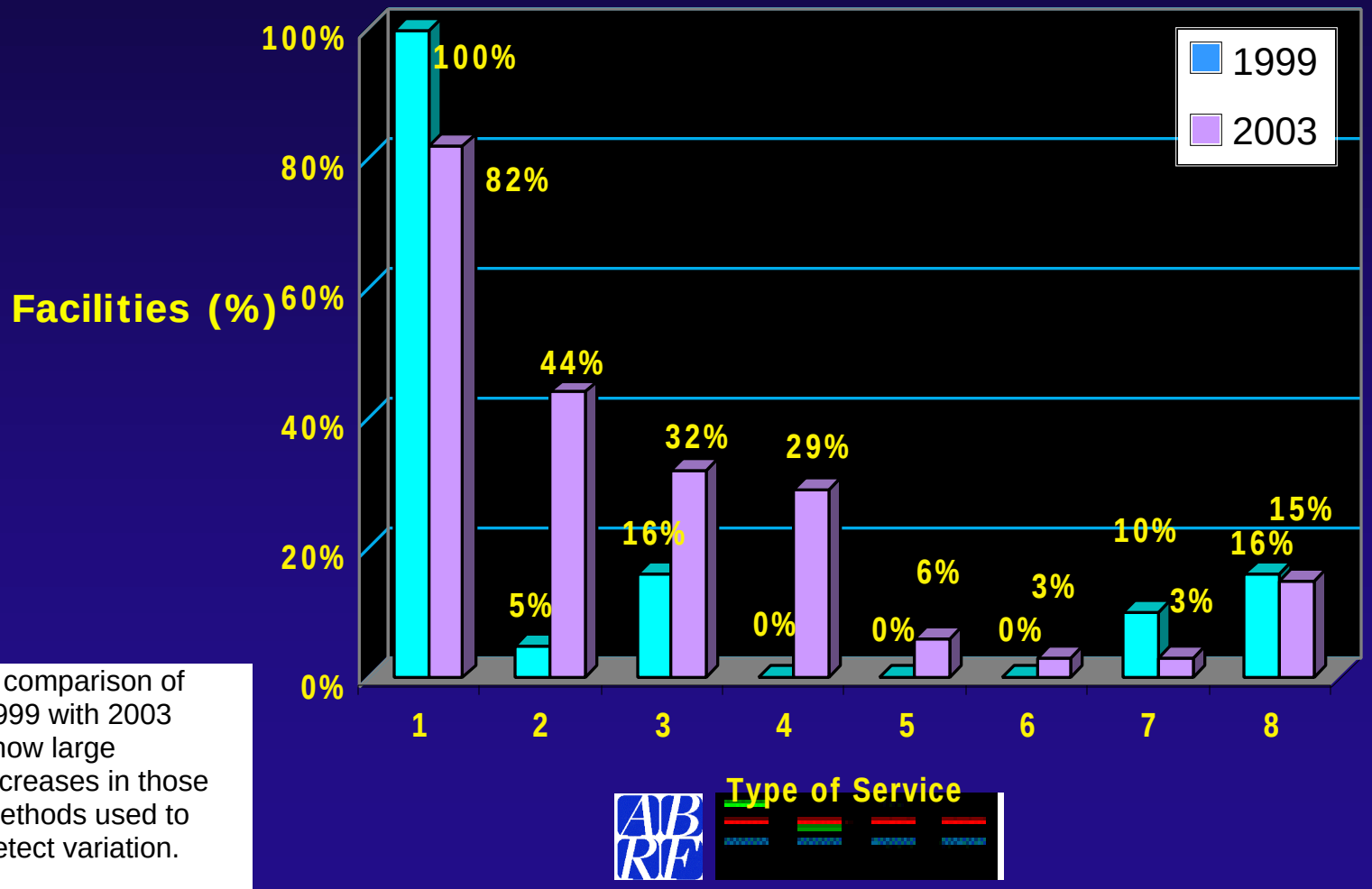
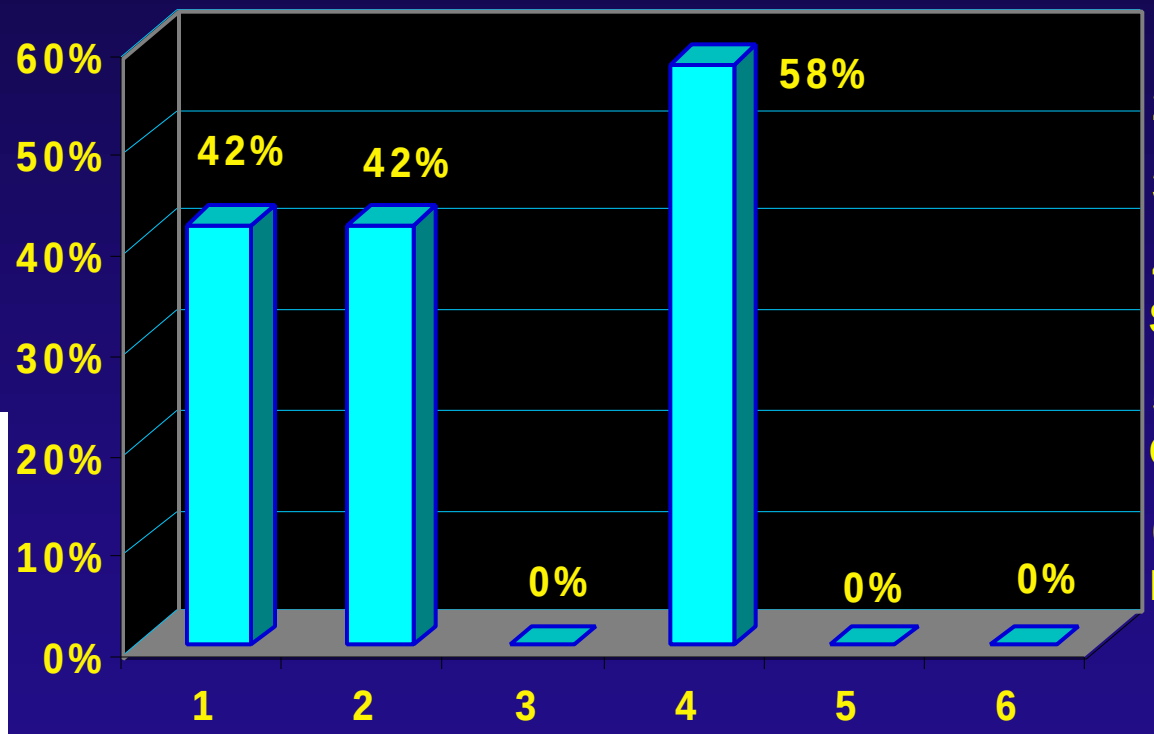
Genotyping Services 1999 vs 2003



1. STRs
2. SNP
3. AFLP
4. RFLP
5. ISSR
6. DiffDis
7. SSCP
8. Other

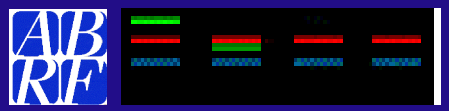
A comparison of 1999 with 2003 show large increases in those methods used to detect variation.

Marker Development 1999



Facilities (%)

Fragment analysis resource facilities are also providing services related to marker production. Almost half of the participants are providing marker selection, design and synthesis. Other services listed were not included on the 1999 survey.



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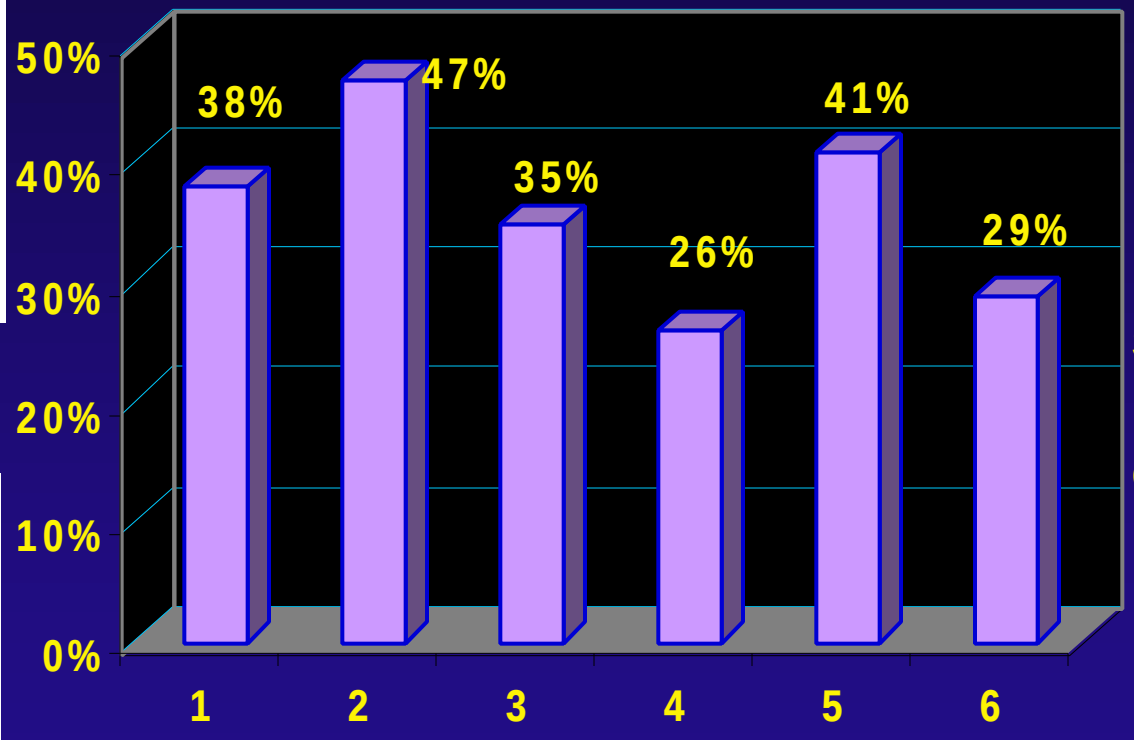
Marker Development 2003

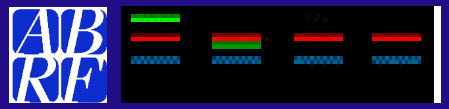
In 2002 we found the number of facilities that provide some type of service for identifying and synthesizing markers. The largest drop was for marker synthesis. Although there has been an apparent drop in synthesis, there was also an increase in the number of particpants from 1999.



Facilities (%)

1. Marker Selection
2. Marker Design
3. Ordering
4. Marker Synthesis
5. Marker Optimization
6. Panel Development

The total number of facilities that still provide marker synthesis in 2002 is almost the same as in 1999.



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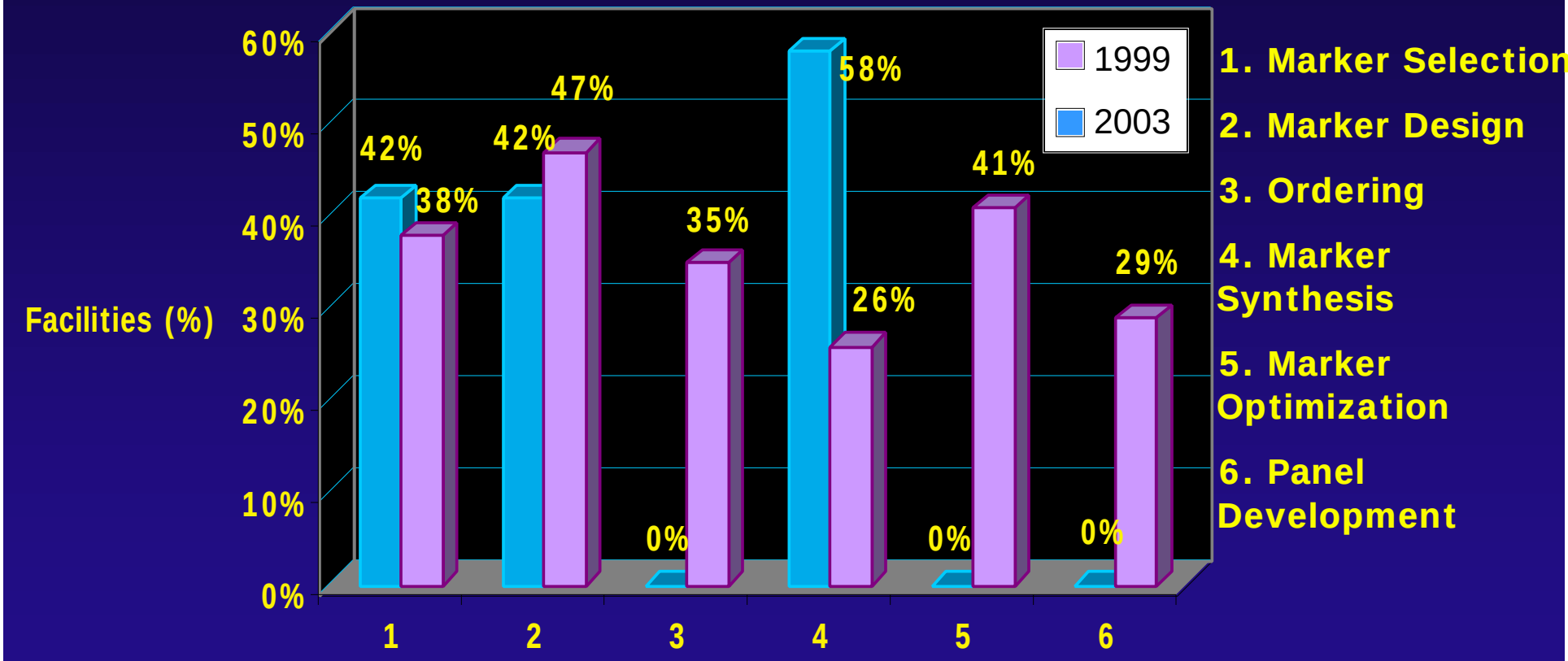
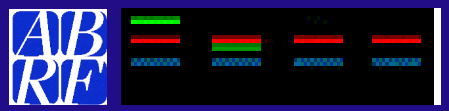
Marker Development 1999 and 2003

A comparison of marker related services in 1999 with 2003 show that resource facilities are maintaining consultation type services such as selection and design. Ordering, optimization and panel development could not be compared because these quesions were not included on the 1999 study. There was, however, a drop in the percentage of facilities providing marker synthesis. But, since the number of participants increased from 20 in 1999 to 34 in 2003, the number of faciltiies providing marker synthesis is about the same.





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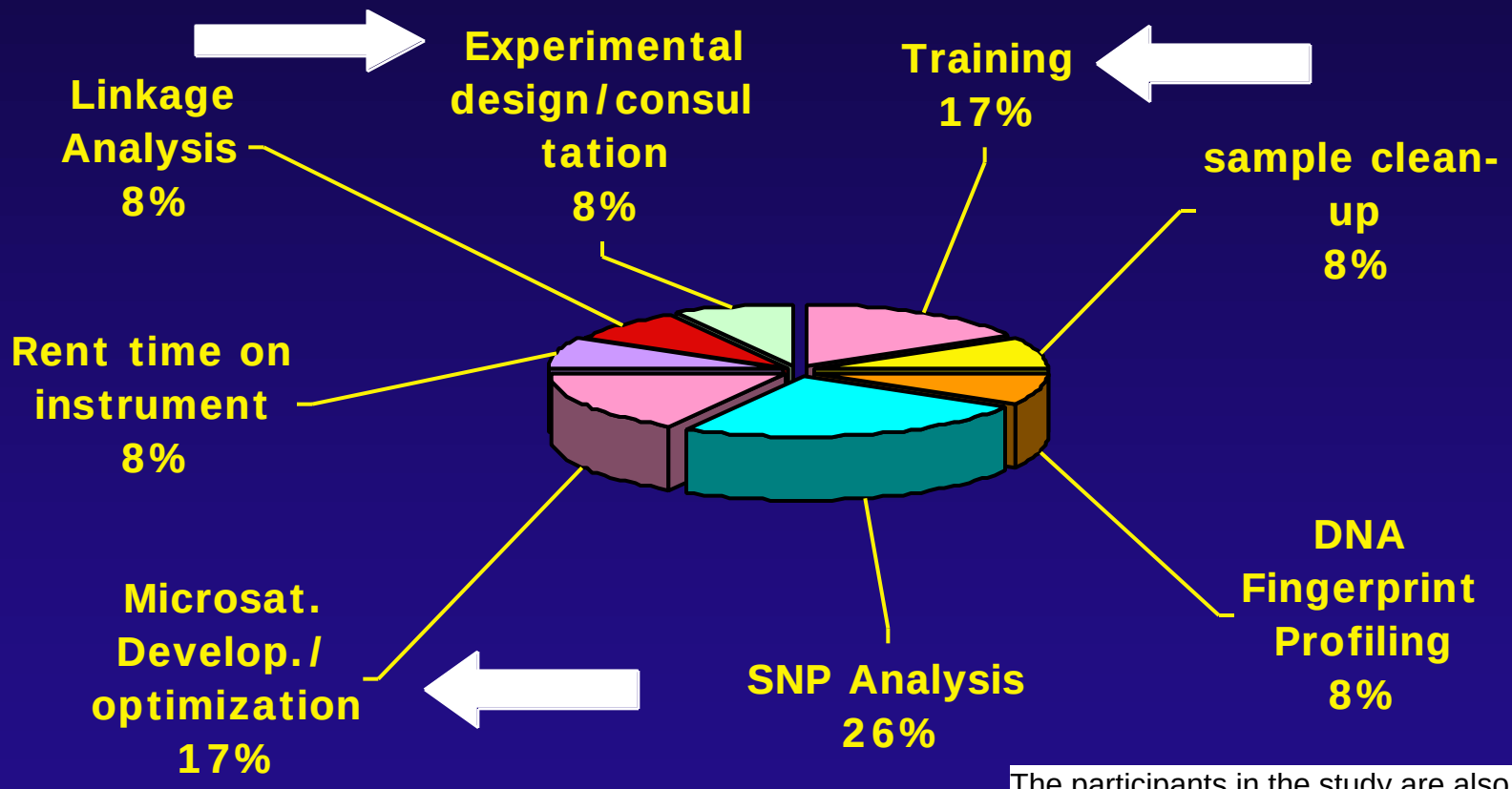
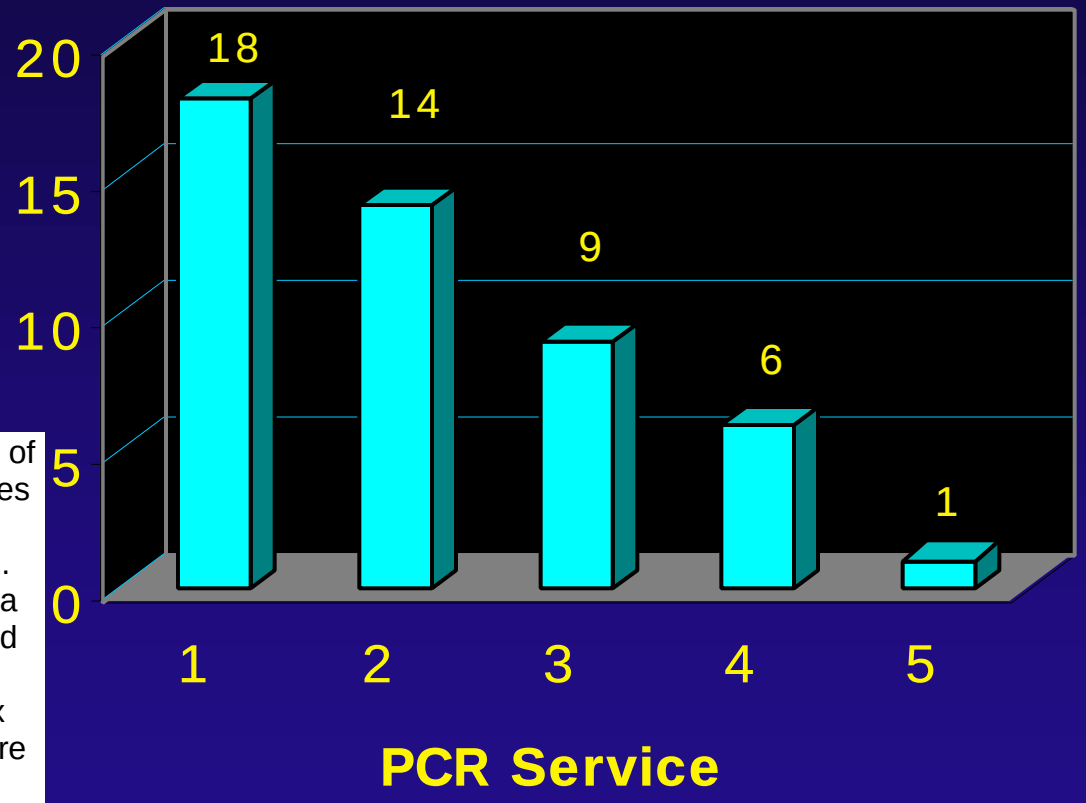
Other Services Provided



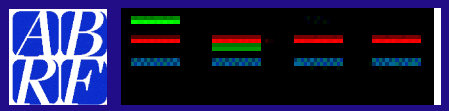
The participants in the study are also providing additional services. Three that I would like to highlight are related to training and consultation and include training, experimental design and optimization.

Other Services



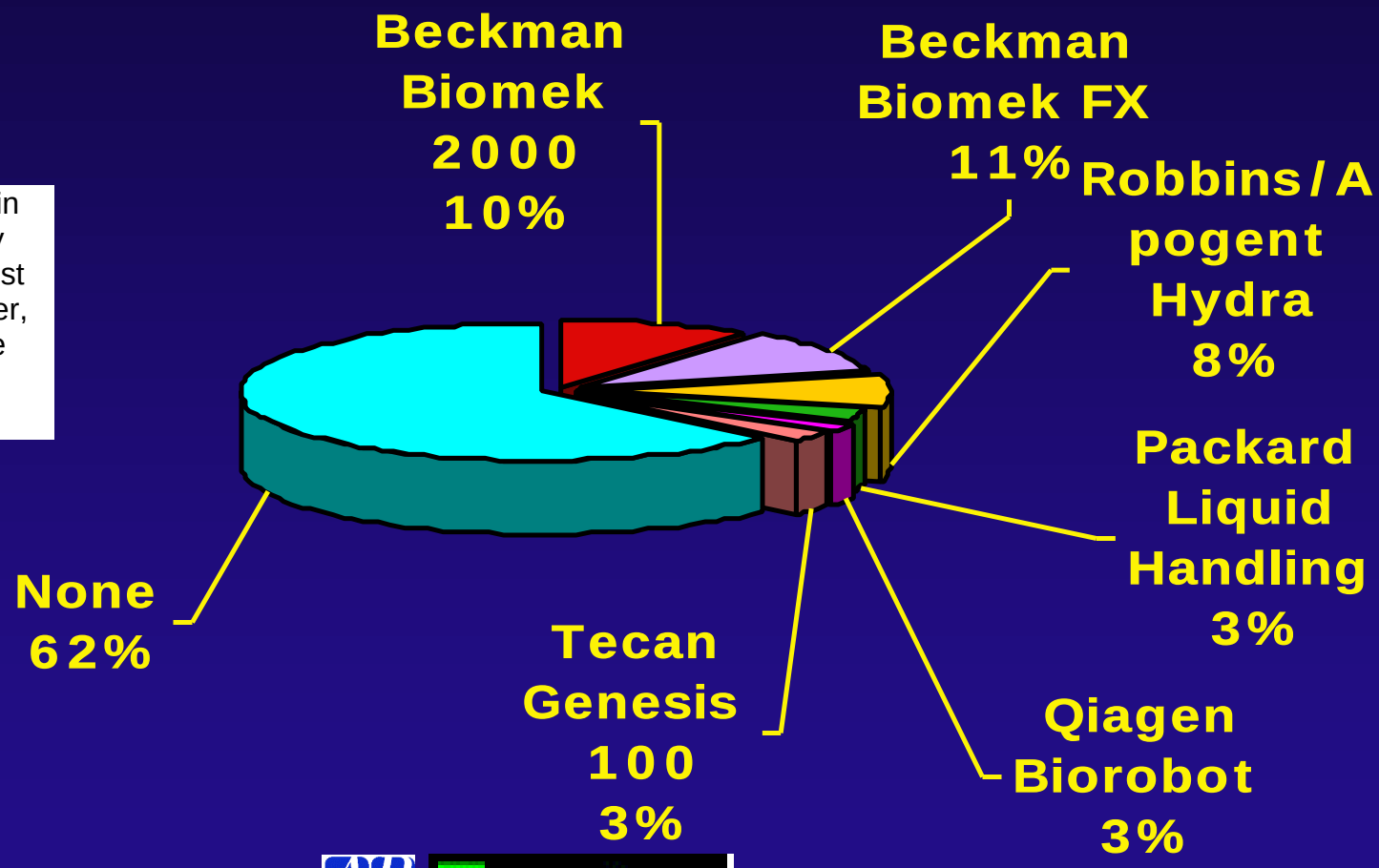
1. Single PCR
2. Single and Multiplex PCR
3. PCR Optimization
4. PCR Clean-up
5. No PCR but PCR Clean-up

So, what about the types of PCR? Of the 34 responses to the study, 18 facilties are providing single PCR. That would be PCR with a single set of markers. And 14 are providing both single PCR and multiplex PCR. Only 9 faciltiies were providing optimization. Other services related to PCR include purification (clean-up) following PCR and one that provides only purification.

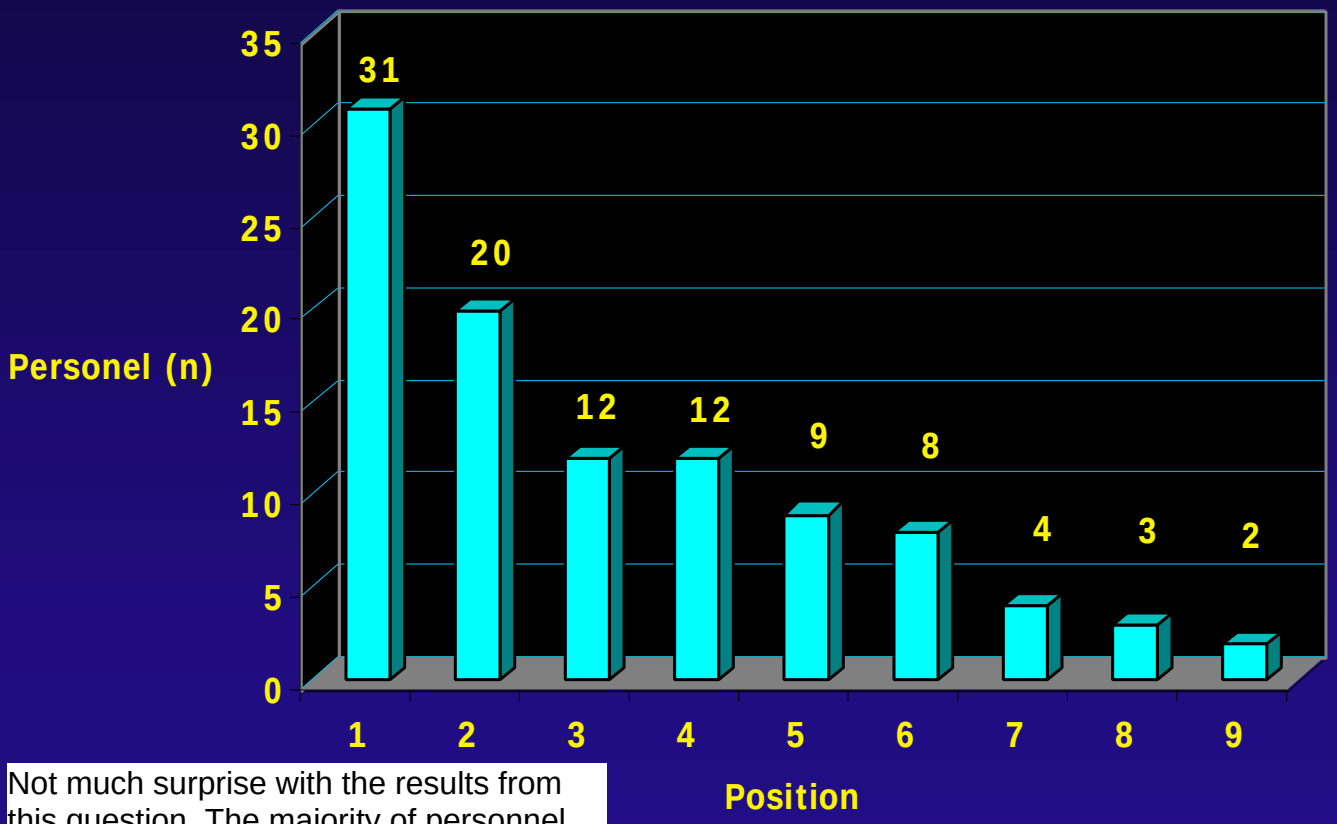


Robotic Support

Many of the participants in the study stated that they are using robotics to assist in the laboratory. However, more than half, 62 %, are not using robotics.



Position



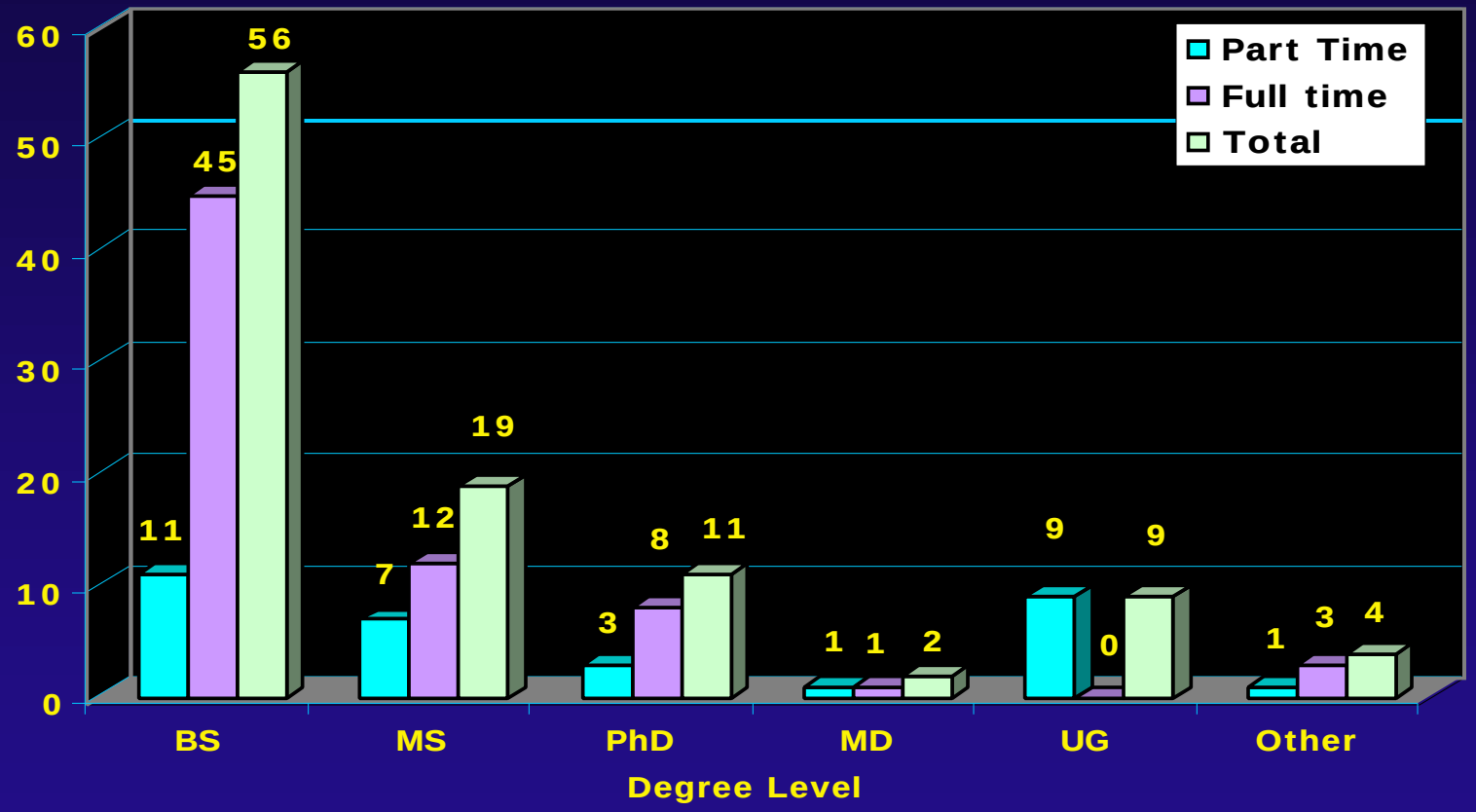
1. Technician
2. Other
3. Students
4. Research Assistant

Senior Research Assistant

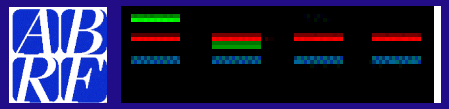
5. Manager
6. Director
7. Researchers
8. Analyst
9. Post Doc

Not much surprise with the results from this question. The majority of personnel in the resource facility are technicians, students and research assistants and they follow the guidance and supervision of the Directors and Faculty Advisors.

Degree Level



Th is question relates to the results shown in the previous slide. The large majority of personnel have completed their requirements for a Bachelors degree followed by a Masters Degree. Those who have achieved the PhD level direct and advise.



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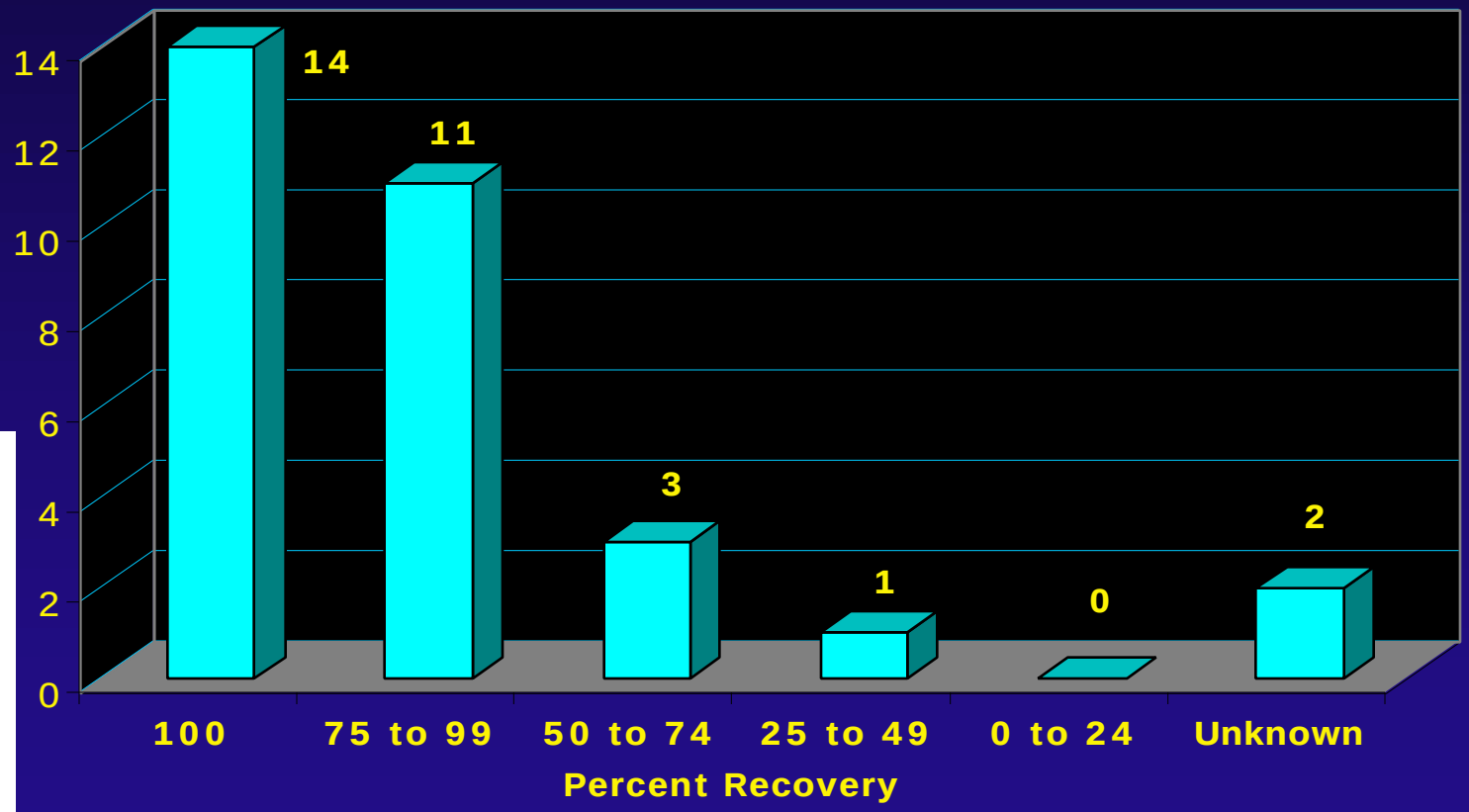
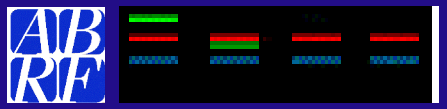
Cost Recovery



The question on cost recovery deals with ability of a resource facility to recover costs of operation with or without subsidy. Most laboratories are recieving limited amounts of income through subsidies and about 40 % are receiving no subsidy.



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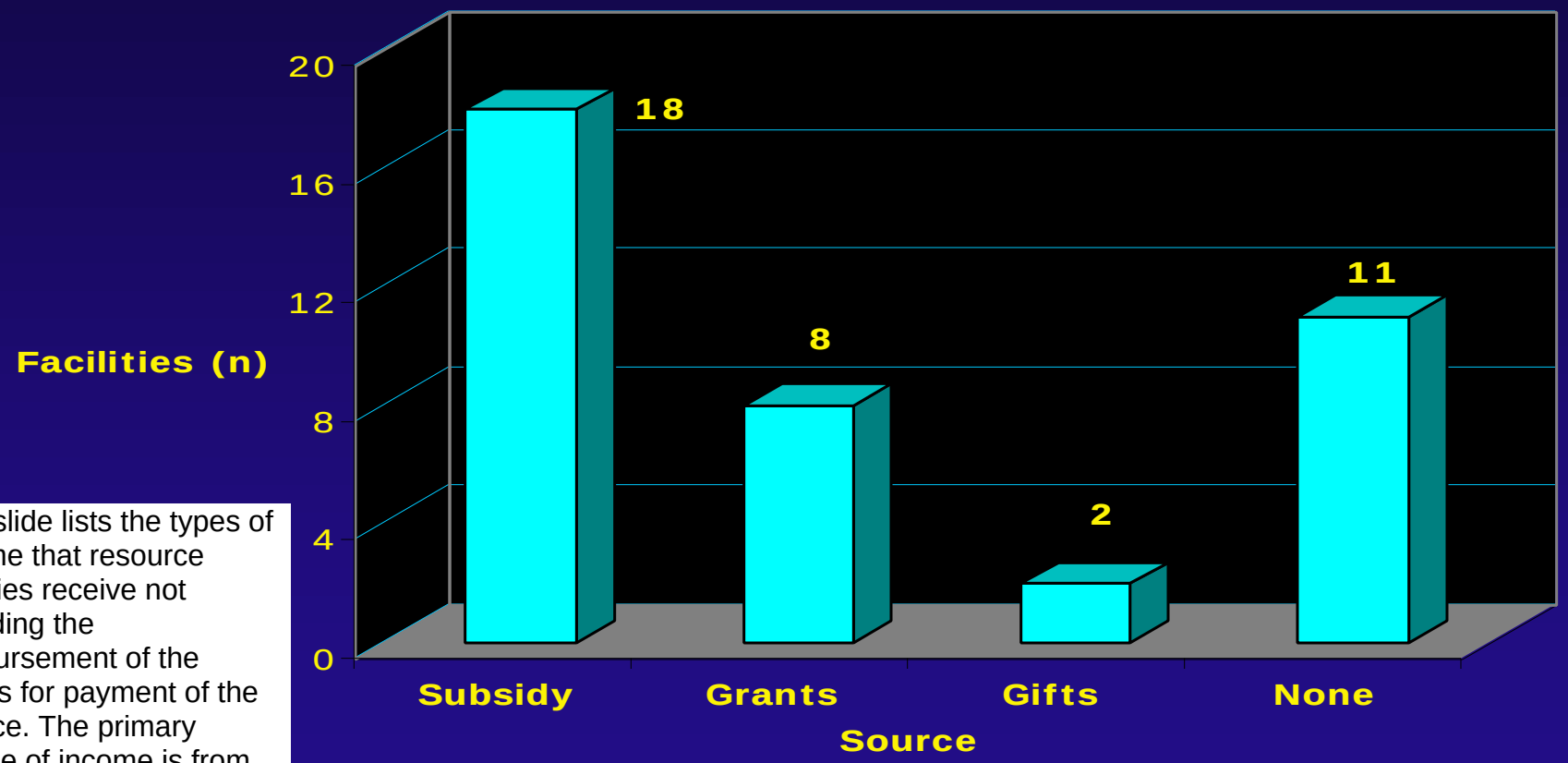
Supplemental Income



This slide lists the types of income that resource facilities receive not including the reinbursement of the clients for payment of the service. The primary source of income is from the University followed by grants.

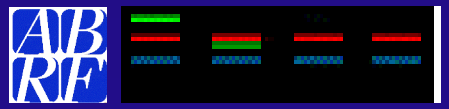
Conclusions

What changes have been made in 4 years ?

1. Capillary Electrophoresis has emerged and grown rapidly in fragment analysis studies. But slab gel sequencers are still widely used.

2. Methods used to determine variability and polymorphisms have increased.

3. Alternate platforms for fragment analysis have increased.

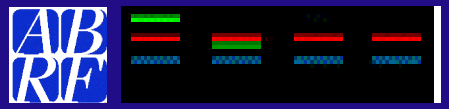


Conclusions

What other services are provided ?

1. Laboratories still provide additional services related to fragment analysis such as marker design and development.

2. Facilities also provide consultation and education type services such as training, marker design and development and experimental design.



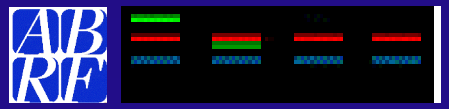
Conclusions

Current Trends

1. Short Tandem Repeat analysis (micro-satellites) is still provided by most facilities.

2. Methods of fragment analysis are used to detect variability such as SNPs, AFLP and RFLP.

3. Approximately 60 % of the resource facilities are receiving supplemental income.



Acknowledgments

We would like to express our appreciation to all the participants of the 2003 study.

We would also like to thank Doug Borngasser. for his hard work in preparing the study on line survey.

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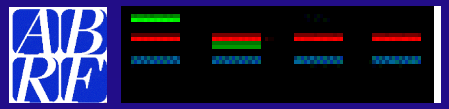

Round Table

Fragment Analysis Research Group