**Presentation Outline**

- Why bother with the literature?
- What is the literature you should be concerned with reading?
- What are some strategies for reading the literature?
- What resources exist for finding papers?
- What resources exist for storing and retrieving information related to the literature?
- How do I go about writing an article?

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**Are You an Expert?**

- What kind of expert witness will you be?
- Do you know the field as well as you need to?
- Reading the literature is critical to your ability to be an effective expert!

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**Why Discuss the Literature?**

- NYC OCME is a progressive lab with an active research group (doing Y-STRs, mtDNA, LCN, pathology)
- I think it will be more useful to share literature strategies with you than labs that may not be as progressive
- How we manage information is critical to success in the information age we live in today

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**Revised Quality Assurance Standard Requirement for Literature Review**

Quality Assurance Standards for Forensic DNA Testing Laboratories (effective July 1, 2009)

5.1.3.2. The laboratory shall have a program approved by the technical leader for the annual review of scientific literature that documents the analysts’ ongoing reading of scientific literature. The laboratory shall maintain or have physical or electronic access to a collection of current books, reviewed journals, or other literature applicable to DNA analysis.


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**I am trying to get you “hooked” on literature**

- I want to teach you to fish rather than just giving you some fish…

> Give a man a fish and you feed him for a day. Teach a man to fish and you feed him for a lifetime.

—Chinese Proverb

> “Give a man a fish; you have fed him for today. Teach a man to use the Net and he won’t bother you for weeks.”

—Author unknown

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http://www.cstl.nist.gov/biotech/strbase/training.htm
Literature Tracking
NYC OCME Forensic Biology Continuing Education Seminar

March 25, 2009

Benefits of Literature Scans

- Become familiar with authors and institutions
- Will improve you as a writer and a presenter
- Will improve your lab’s performance
- Over time you will be building your knowledge

- Remember: You don’t have to master every paper…

The Value of a Journal Club

- Some potential approaches
  - Have specific people looking at individual journals
  - Bring relevant articles to attention of everyone

- J Forensic Sci and FSI Genetics will cover ~90% of relevant articles in forensic DNA
  - Scan journal, distill information, distribute to group

- rQAS requires literature to be available

How many have read any scientific article in the past month?

How not to do it based on my experience

- Passing around individual journals with a reader list attached
  - Very inefficient process because journals get stuck on someone’s desk
  - It becomes challenging to find a specific issue before it is returned to a central repository
  - Some information may not be as relevant (for research) many months later

Forensic Journals

- There are a finite number of journals with the vast majority of primary publications related to forensic DNA analysis

Forensic Science Publications

Journal of Forensic Sciences
DNA publications vs total articles

http://www.cstl.nist.gov/biotech/strbase/training.htm
The First Journal of Forensic Sciences
Articles on DNA (April 1986)

Guest Editorial

Faye Kosier, B.S. Michael Birtel, Ph.D., Robert Baker, Ph.D., and Ivan Balic, Ph.D.

Application of Deoxyribonucleic Acid (DNA) Polymorphisms to the Analysis of DNA Recovered from Sperm

REFERENCES:
G. A. F. Kosier, B. S., Michael Birtel, Ph. D., Robert Baker, Ph. D., and Ivan Balic, Ph. D.

We need your help as good reviewers and authors

Contents in 2007-2008
(8 issues; 148 articles)

- STR population data (23)
- Mitochondrial DNA (23)
- Y-STRs (20)
- X-STRs (9)
- SNPs (9)
- Non-human DNA (6)
- Mixtures (6)
- Low-level DNA (5)
- Rapid screening/portable device (4)
- Degraded DNA/minisSTRs (3)
- Disaster victim identification (3)
- DNA extraction (3)
- DNA quantitation (3)
- ISFG DNA Commission (2)
- Introductory information (2)

- DNA databases (2)
- Expert systems (2)
- Paternity testing (2)
- Phenotype information (2)
- Review articles (2)
- Forensic pathology (2)
- Tri-allelic variants (2)
- Telogen hair analysis (2)
- Laser microdissection (2)
- Statistical issues (2)
- Troubleshooting (1)
- DNA sources (1)
- Post-conviction DNA testing (1)
- Potential disease linkage (1)
- Case studies (1)
- Serology (1)

AAFS 2009 Topics Regarding Forensic DNA
From abstracts of presentations at AAFS meeting in Denver, CO (Feb 2009)

- Improved DNA extraction
- Predicting hair color and ancestry with SNPs
- X-chromosome STRs
- Familial searching
- Y-STRs and mixtures
- Low level DNA samples
- miniSTRs
- DNA screening assays
- Optimizing database labs
- Microfluidic biochip systems
- Use with property crimes
- Recovery from handguns
- DNA from IEDs
- Expert systems
- Automation with robotics
- DNA quantitation – qPCR
- PCR directly from blood
- miDNA
- RNA
- Non-human DNA (dogs & cows)
- Mixture interpretation

Some recent relevant articles

- Gill et al. 2009 – low level DNA thresholds
- Schneider et al. 2009 – mixture classification
- Vallone et al. 2008 - Rapid PCR

Approaches to Maintaining an Awareness of the Literature

- Foster environment where any employee can bring helpful information to their supervisor and team members

- Prepare reference lists on topics of interest to your lab (or team)
  - Examples:
    - Listing of all articles on mixture interpretation
    - Gathering 70 articles on low-copy number DNA (pdf files and reference list)

http://www.cstl.nist.gov/biotech/strbase/training.htm

March 25, 2009

Forensic Science International: Genetics
http://www.fsigenetics.com/

Editor-in-Chief:
Angel Carracedo (Spain)
Associate Editors:
Peter M. Schneider (Germany)
John M. Butler (USA)

FSI: Genetics is a new journal dedicated exclusively to the field of forensic genetics. It has been launched in 2007 by Elsevier Publishers in affiliation with the International Society of Forensic Genetics. All members of the ISFG receive a free subscription of this journal (print and online version) as part of their membership benefits.
How to Read a Scientific Article

- Skim the article first
  - Start with title and abstract (may consider authors as well)
  - Scan tables, figures and figure captions
- Examine results and conclusions
  - Do the data presented support the statements made?
- Do not worry about trying to comprehend the entire article at first
  - I very rarely read an article from start to finish in its entirety
- Highlight key points and make notes on the paper itself so you can go back to them later to refresh your memory

Approaches for On-Going Information Searches on Topics of Interest

- Review entire journal listing of articles
  - Pick up journal or view table of contents on-line
- Directed searches on specific topics
  - PubMed
- Sign up for table of contents delivery via email
  - Examine publications cited in review article

Analytical Chemistry Application Review

June 15, 2005 issue of Analytical Chemistry

Forensic Science

T. A. Brofford
Office of Central Sciences, New Jersey State Police, New Jersey Forensic Science and Technology Complex, 3350 Nacogdoches Road, Horizon Center, Hamilton, New Jersey 08690-0311

J. M. Butler
National Institute of Standards and Technology, Gaithersburg, Maryland 20899-3311

R. B. Risensteiner
Jr. 1324, Mount Laurel, New Jersey 08054

250 articles referenced covering forensic DNA analysis during 2003-2004

Analytical Chemistry Application Review

250 articles referenced covering forensic DNA analysis during 2003-2004

PubMed Searches


The Public Library of Science (PLoS) offers free on-line access to scientific articles

http://www.plos.org/
Literature Tracking
NYC OCME Forensic Biology Continuing Education Seminar

http://www.cstl.nist.gov/biotech/strbase/training.htm

• Organize and search your PDF collection
• Collect papers
• Access millions of papers
• Keep up to date with paper alerts
• Read your papers from anywhere
• Recommend papers to colleagues
• Manage your lab

http://labmeeting.com/

Zotero
http://www.zotero.org/

Pubget
http://pubget.com/search

http://www.mendeley.com/

http://www.scholar.google.com

Pubget provides access to pdf articles
Literature Tracking
NYC OCME Forensic Biology Continuing Education Seminar

March 25, 2009

Literature Management

• Used to spend 2+ hours per week in the library
• Now can access articles via NIST Virtual Library from my desk
• Consolidated Reference Manager database

Our Project Team Library

>8,000 references gathered and cataloged in Reference Manager

• Started by Christian Ruitberg
• Maintained now by Jan Redman
• Updated Monthly and provided to NIST Human Identity Project Team

Strategy for Information Flow

Locate, Print, and Classify Articles

Catalogs and Files Articles

Updates supplied once a month on CD

Reference Manager Database

As of March 2009: 4785 references in AllRef and 3258 references in STR_Ref

Adding almost 1000 new articles each year

WizFolio

Demonstrate Reference Manager searches and generation of bibliography

Reference Manager Software

http://www.wizfolio.com

http://www.refman.com/
Fruits of a Good Literature Collection

Review Articles
- Genetics and Genomics of Core Short Tandem Repeat Loci Used in Human Identity Testing
- Analytical Chemistry (June 15, 2007 Issue)

Textbooks
- Forensic Science
  - 2nd Edition
  - 688 pp.
  - Feb 2005

And a Useful Reference Website…

STRBase: Developed as a Central Information Resource for Forensic DNA Typing

A comprehensive listing of STR articles is available based on my information collection

http://www.cstl.nist.gov/biotech/strbase/

Personal Journal Holdings
- American Journal of Human Genetics (2001-present)
- Genome Research (2001-2007)
- Forensic Science International (2001-2007)
- NIST Library provides electronic access
- Forensic Science International: Genetics
  - complimentary subscription as the Associate Editor
- International Journal of Legal Medicine (2001-present)
- NIST Library provides electronic access
- Legal Medicine (2001-present)
- Free journals: Nature Methods, Biotechniques, Forensic Magazine, Genome Technology, American Laboratory

Some funded from 2002-2007 by PECASE award money

Collection of Journals in My Office

http://www.cstl.nist.gov/biotech/strbase/training.htm
DNA Books Collected

- **Have purchased 266 books** on topics related to forensic DNA analysis as of March 2009

   ![DNA Books]

   Funded from 2002-2007 by PECASE award money

Some Recent Books on Forensic DNA

![Some Recent Books]

Collection of Notes from Meetings Attended

Why you need to write up your work

- Peer-review usually generates quality information
- Talks are not held to the same standard as a written publication (that has been reviewed)
- A written publication is also accessible to those who did not attend a presentation and is archived for future scientists to read

The Peer-Review Process

Based on My Perspective as an Editor

- Authors write article according to journal guidelines (each journal has an “Instructions for Authors”)
- Steps during review
  - Article submitted to journal by corresponding author
  - Assigned to an editor
  - Editor asks 2 or more scientists to review the article in a specific timeframe (usually 2-3 weeks)
  - Editor takes reviews into consideration and responds to author with Accept, Revise, or Reject; “Revise” is most common
  - Author revises article and resubmits it for another review

   Unfortunately, busy scientists often do not complete their review in a timely fashion (requiring the editor to remind them)

How to Write a Scientific Article

- **Outline the ideas first** with a purpose and plan
  - Decide on scope, design experiments, & collect data
- Write Materials and Methods section first
- Prepare all figures & tables
  - captions should be stand-alone
- Write Results and Discussion based on data shown in figures & tables
- Write Introduction to provide context to your work
- Prepare reference list according to journal format
- **Write abstract last**
  - Most critical piece since it will be the most read!

http://www.cstl.nist.gov/biotech/strbase/training.htm
George Whitesides on how to write a scientific article


Whitesides’ Group: Writing a Paper

By George M. Whitesides

1. What is a Scientific Paper?
   - A paper is a logical description of hypotheses, data, and conclusions intended to convince the readers. Papers are not a snapshot of all results. If your research is not consistent, a reader would be suspicious. Therefore, your paper should be a logical description of your results.

   *Making your data readable to others you will find your research in question and test hypotheses to determine conclusions from your data and to think logically about your data.*

2. How Should You Organize a Paper?
   - A paper is not just an outline for containing a common theme. It should be a logical description of your results.

   *Making your data readable to others you will find your research in question and test hypotheses to determine conclusions from your data and to think logically about your data.*

3. How Should You Cite Your Sources?
   - Important to know where something came from because you might need to go back to it.
   - Not all information is of equal value or importance.

Additional Thoughts

- Make time each week to continue your education
  - read an article once a week during lunch
  - read during your commute

- Take detailed notes with each meeting you attend and then share what you learned with others

Bibliometrics

- Impact factor (for journals)
  - The impact factor is a measure of the citations to science journals and is usually thought to reflect the importance of a journal to its field. The impact factor was devised by Eugene Garfield, the founder of the Institute for Scientific Information, now part of Thomson, a large worldwide US-based publisher. Impact factors are calculated each year by Thomson Scientific for those journals which it indexes, and the factors and indices are published in Journal Citation Reports.

- h-index (for authors)
  - The h-index is based on a list of publications ranked in descending order by the Times Cited. The value of h is equal to the number of papers (N) in the list that have N or more citations.

H-index Calculation