

Biotechnology and Computer Technology

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Workshop on Intellectual Property (IP) Use in Biotechnology

IP rights like patents and trade secrets can be vital for a company as demonstrated by the several billion dollars revenues of Amgen, based on essentially two biologicals. Starting with this and other examples, the workshop group will discuss the potential changes in the creation of business value with IP, based on new Internet based companies like delphion and Yet2.com.

Computers in Biotechnology

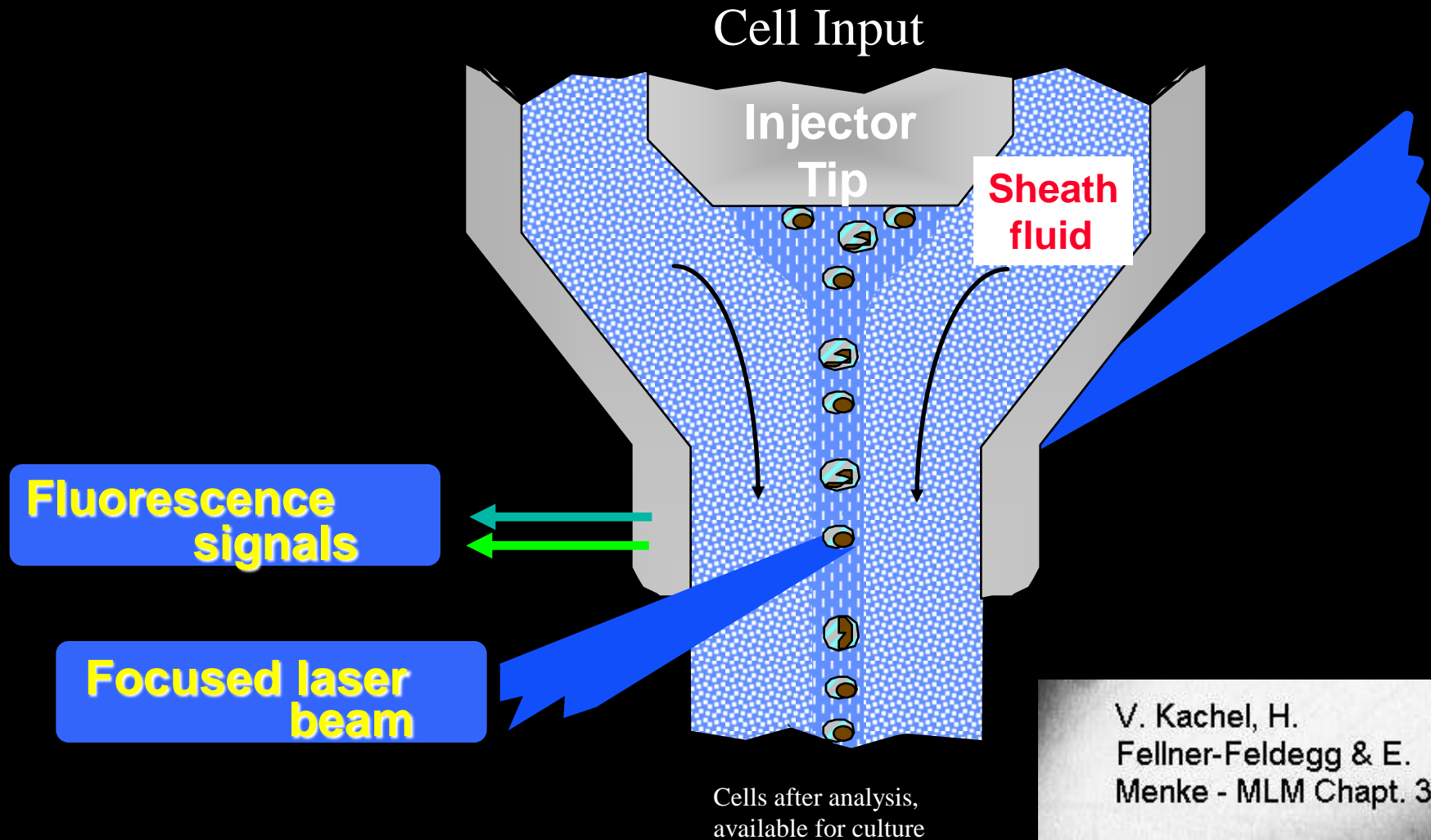
- Simple numerical calculations
- Data acquisition support of Instrumentation
- Simulations
- Sequence alignments
- Pattern recognition
- Literature and data searching
- The Internet

Workshop Discussion

- Historical development of computer uses for cell analysis
- Impact of computer technologies on the use of intellectual property
- Breakout group discussion
- Presentation and discussion of breakout group results

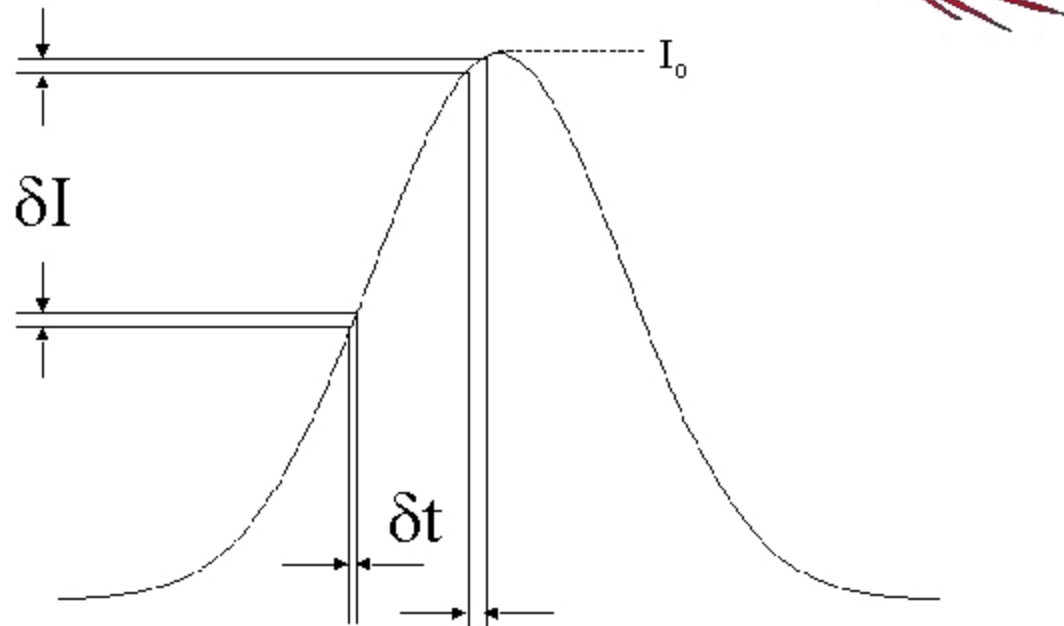


Flow Cytometer Fluidics



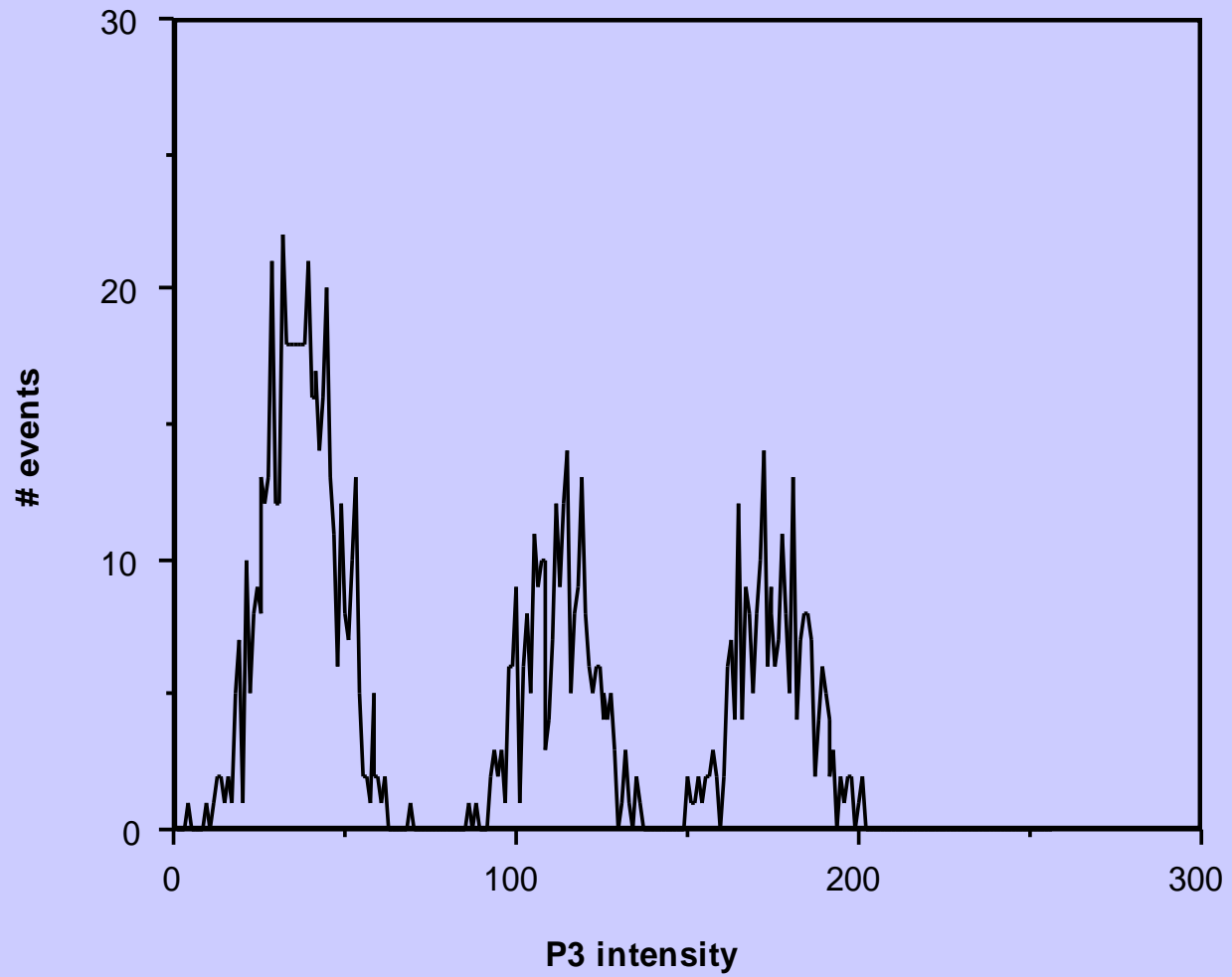
Temporal Averaging: Gaussian Pulse

LVW Research Group



Assume weighting is proportional to δt

Event histogram

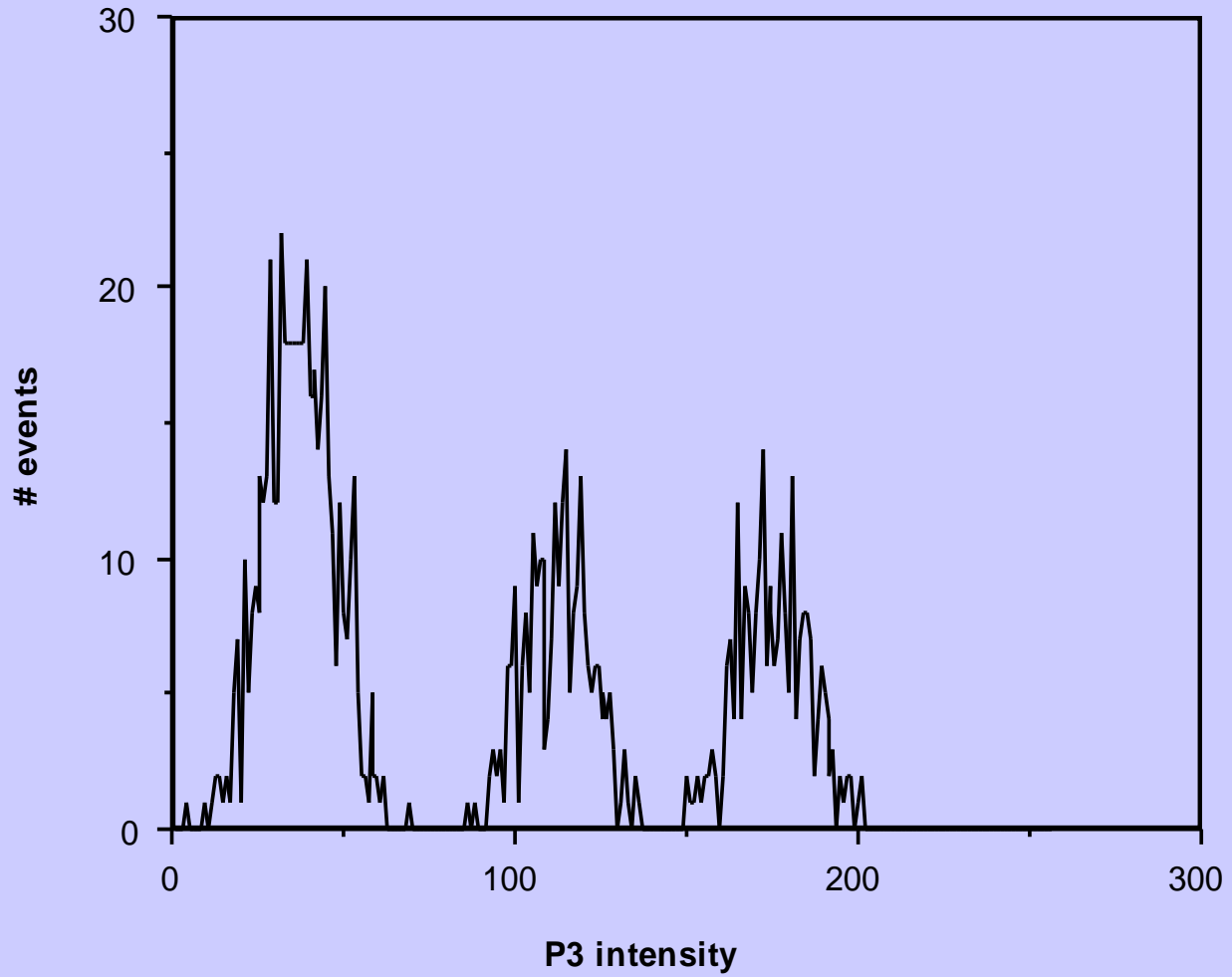


Cell	P1	P2	P3	P4	P5	Population #
1	242	135	704	175	612	1
2	146	132	690	178	566	1
3	269	147	89	206	580	3
4	442	143	399	250	255	4
5	212	167	155	926	526	2
6	269	2	659	207	575	1
7	204	232	112	171	679	3
8	152	74	160	828	532	2
9	166	126	208	157	666	3
10	252	92	91	147	638	3
11	160	46	668	164	622	1
12	243	119	160	188	660	3
13	244	50	72	261	543	3
14	208	129	167	845	583	2
15	178	138	138	200	514	3
16	410	170	451	271	274	4
17	235	68	172	971	579	2
18	209	59	675	262	588	1
19	160	148	683	175	578	1
			...			
9994	182	142	123	915	559	2
9995	175	53	153	828	539	2
9996	223	186	99	219	612	3
9997	215	119	138	936	662	2
9998	244	50	72	261	543	3
9999	214	137	174	1014	597	2
10000	312	87	110	904	560	2

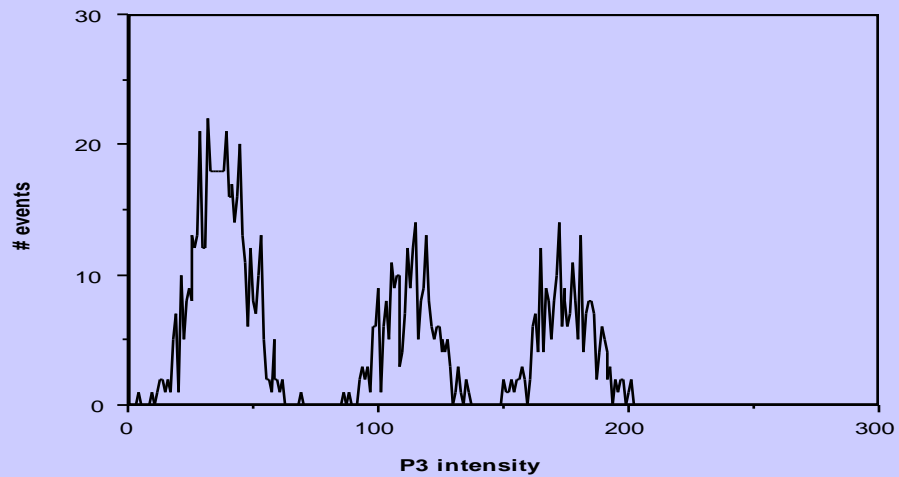
Fig.6: Listmode data from four cell populations with the following means (standard deviations = 80)

P1 P2 P3 P4 P5 p1 P2 P3 P4 P5
 Population1: 200 100 700 200 600, Population2: 200 100 150 900 600
 Population3: 200 100 150 200 600, Population4: 400 150 450 250 250

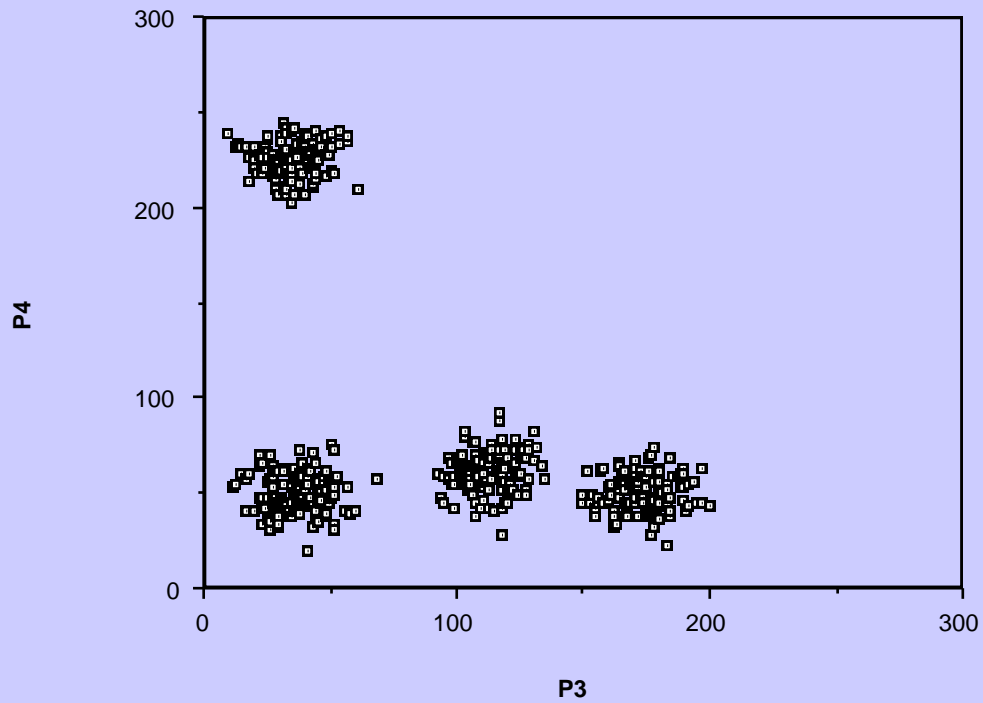
Event histogram



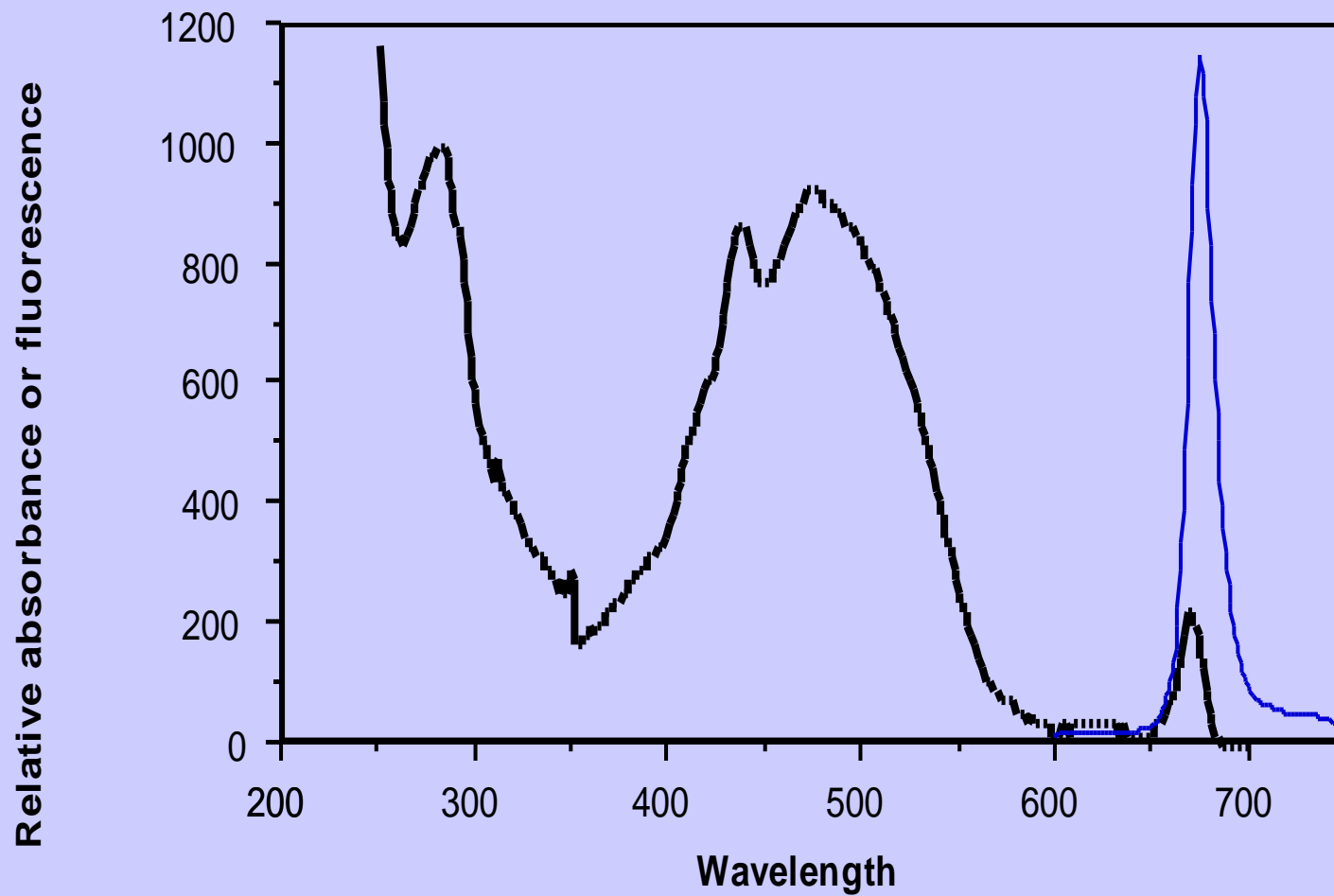
Event histogram

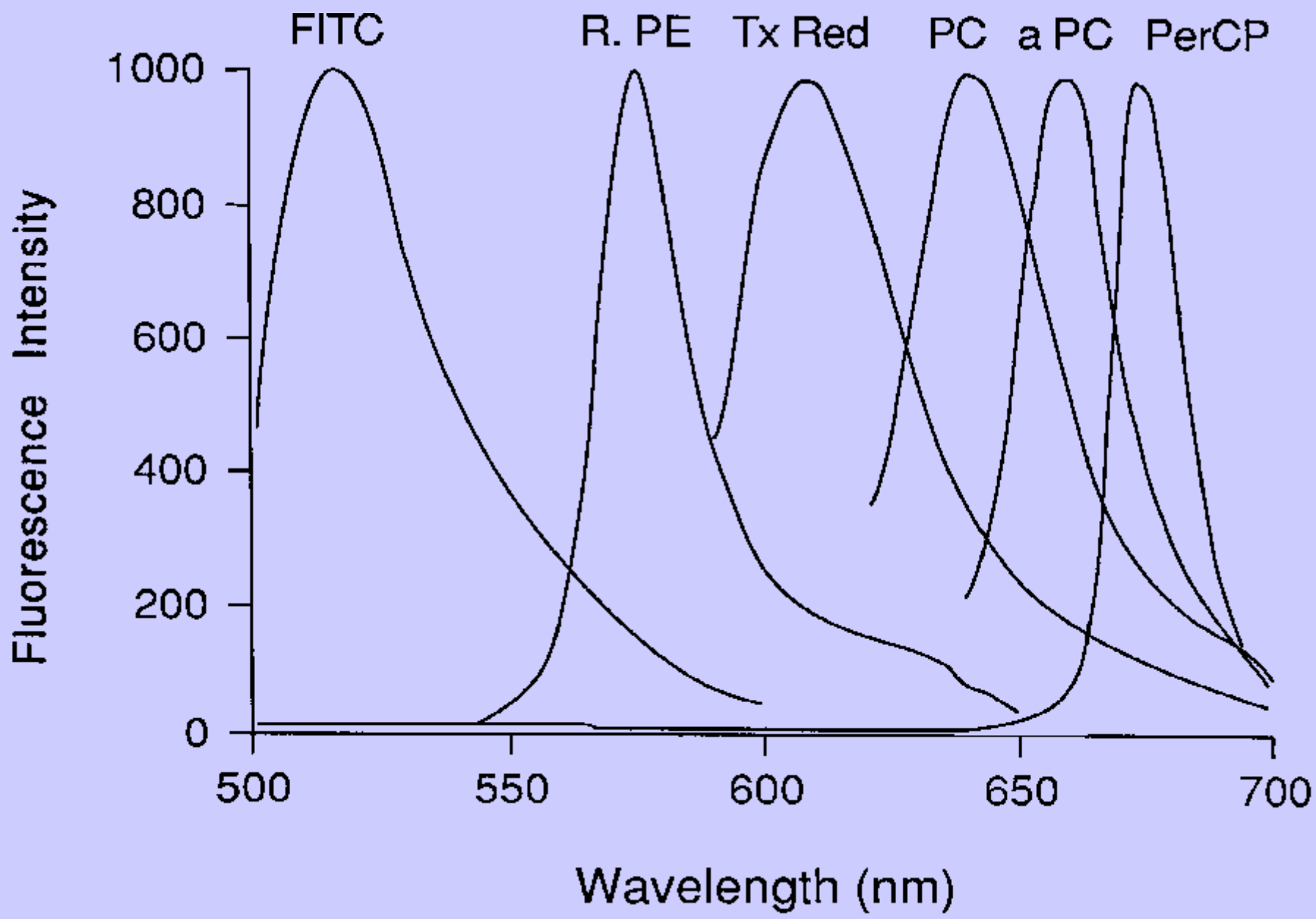


"Dotplot"

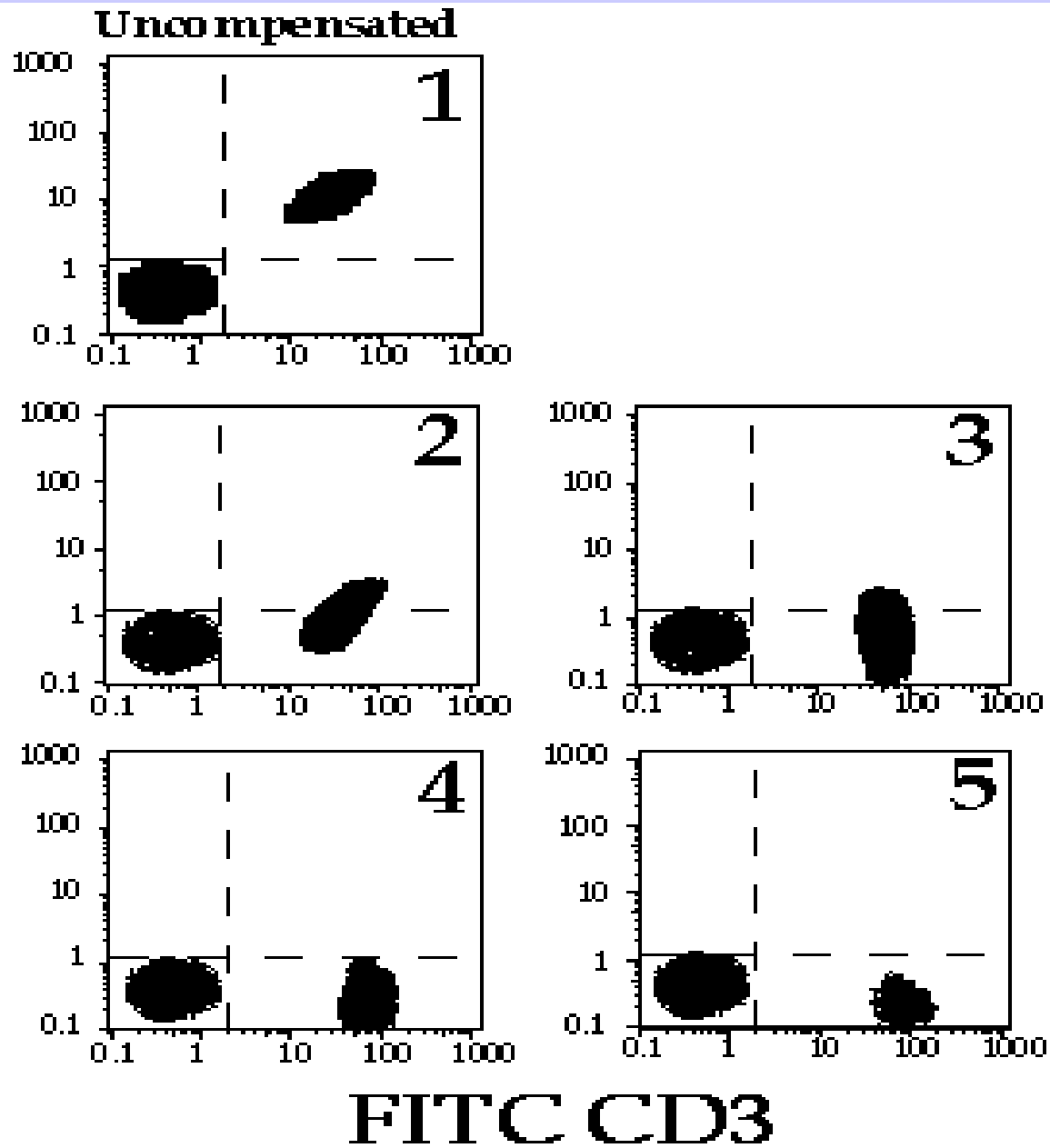


PerCP spectra



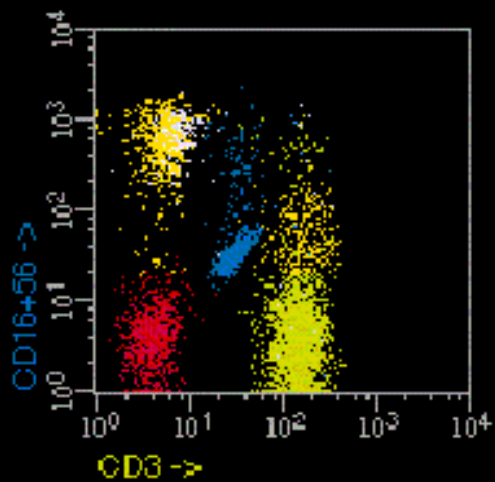


PE (isotype)

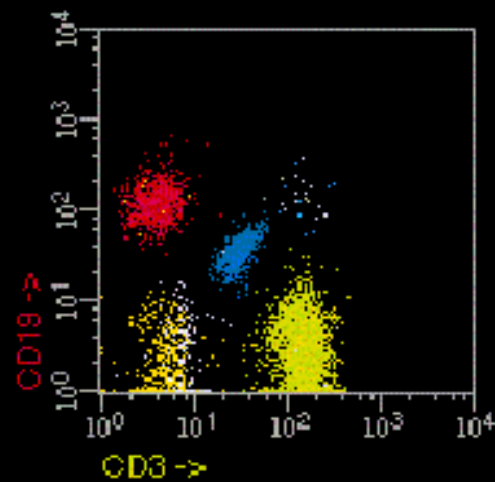


% = 15.7 49.5 13.4 16.1 0.0 0.2 4.7 0.0

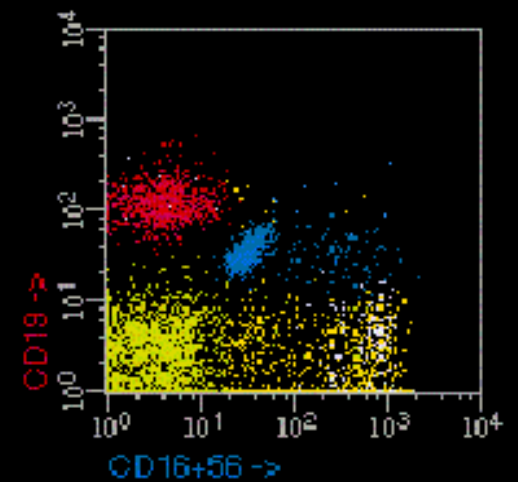
3/16+56/19 PAG Set



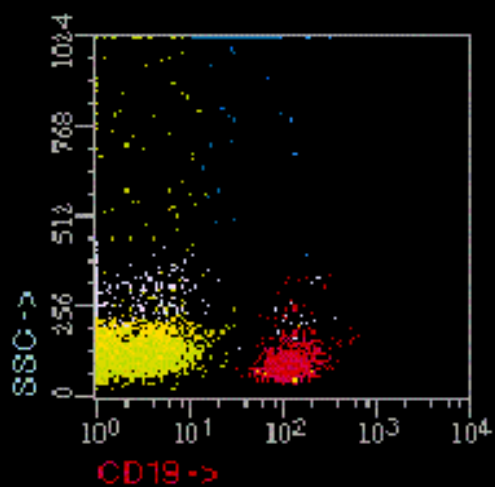
3/16+56/19 PAG Set



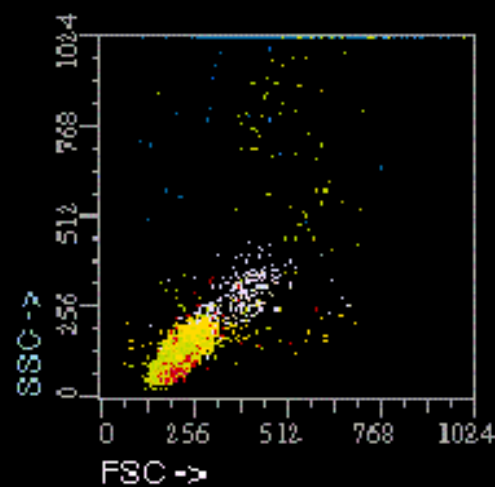
3/16+56/19 PAG Set



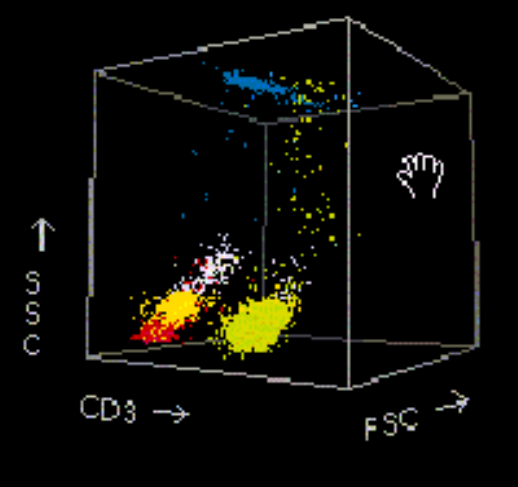
3/16+56/19 PAG Set

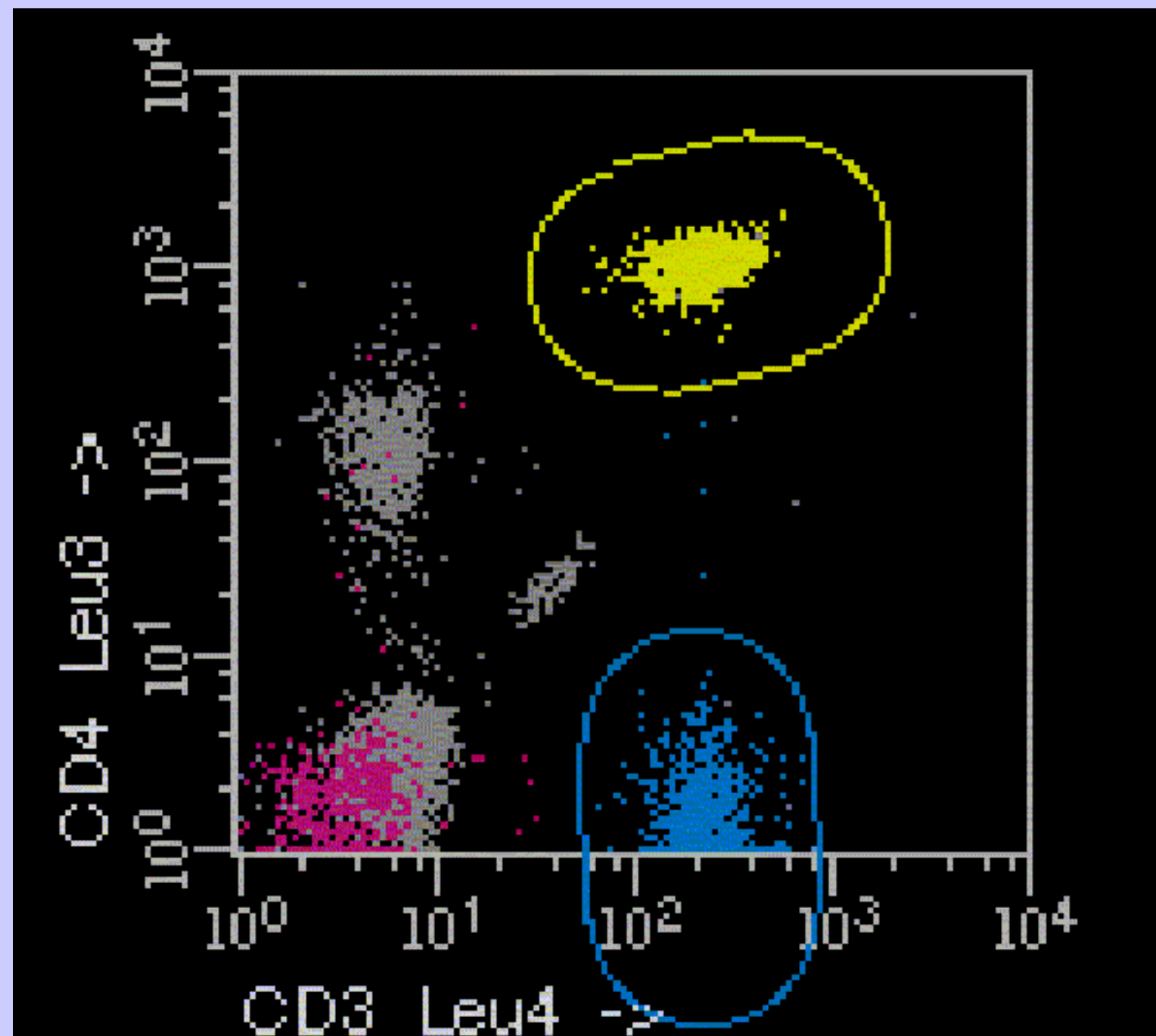


3/16+56/19 PAG Set



3/16+56/19 PAG Set





Cell Biochemistry Martinsried

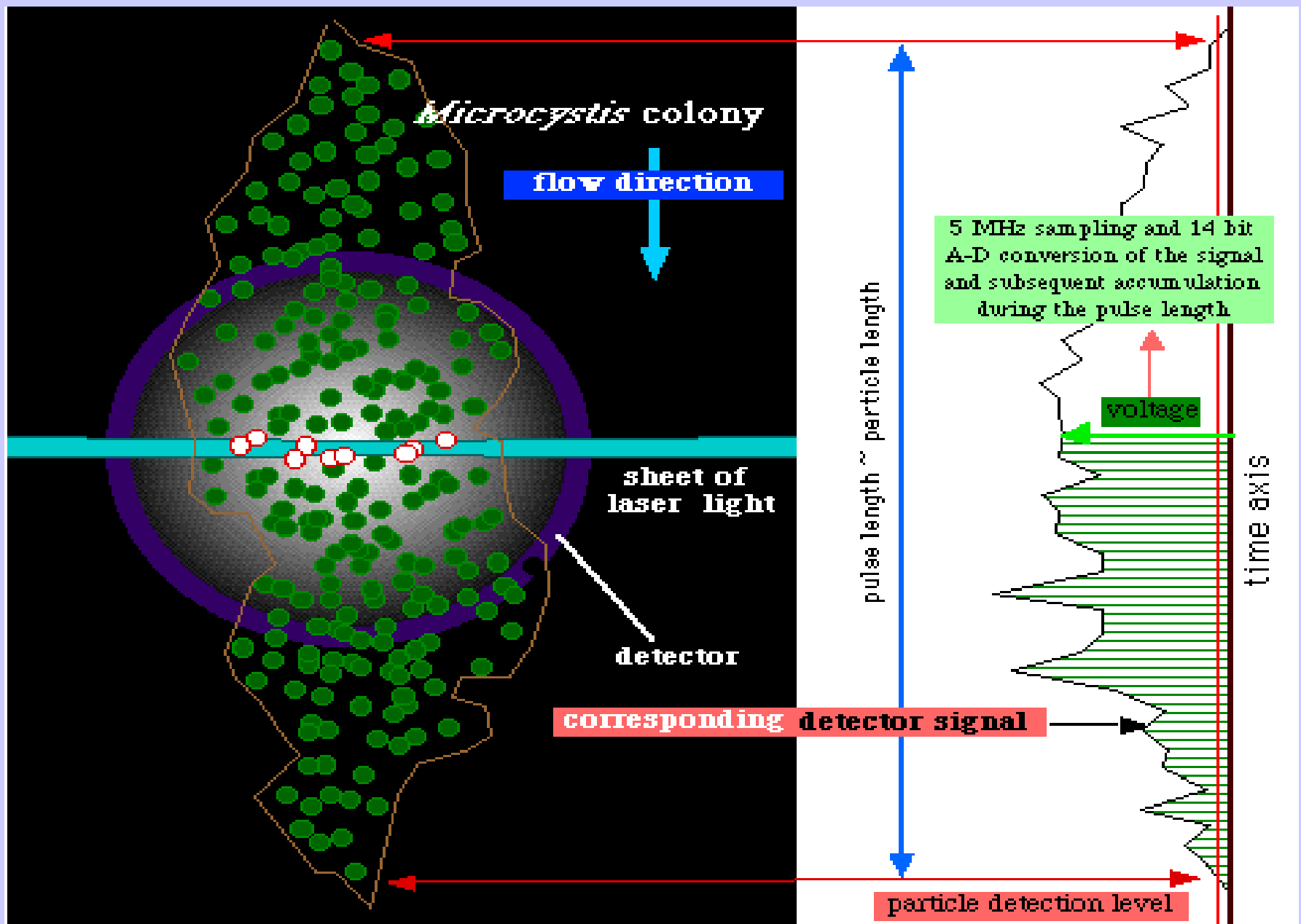
Functional Cell Biochemistry by Flow Cytometry

[G. Valet](#)

- *selected key reference:* [BioMedNet](#)
- [Cell Biochemistry](#)
- [Useful Protocols](#)

Table of Contents

- [1. CELLS AND DISEASE](#)
- [2. CELL STRUCTURE AND CELL FUNCTION](#)
 - [2.1 Structural Cytometry](#)
 - [2.2 Functional Cytometry](#)
 - [2.3 Standardized Multiparameter Data Classification \(SMDC\)](#)
 - [2.4 Applications in Research and Clinical Medicine](#)



Discussion

Intellectual Property

Intellectual Property simply defined is any form of knowledge or expression created with one's intellect. It includes inventions, computer software, trademarks, literary, artistic musical or visual works and even simply know-how.

Inventions may be protected by Patent and Registered Industrial Design. Software, literary, artistic and musical works may be protected by Copyright.

What is Patentable?

A invention must be **novel**, and it must have **utility**.

Products, processes, machines, composition of matter, or any new and useful improvement of any of these, such as new uses of known compounds, are patentable. **Novel, genetically engineered life-forms** and new microbial life-forms can be patented in some jurisdictions, such as the United States, but not in others (the Canadian position is still unclear). **Methods of medical treatment** are also patentable in some jurisdictions, such as the United States, but not in others, including Canada. Provided **software** can meet the usual criteria for patentability, it can be patented in some jurisdictions. *In practice, however, it is almost impossible to meet the novelty requirement, and software patents are very few and far between.* The preferred form of protection for software is by copyright.

New plant varieties can be protected by way of a Planter Breeders Right in Canada or a Plant Patent in the United States. Some other jurisdictions, but by no means all, have equivalent legislation.

Integrated Circuit Designs can be protected in the United States under the Maskworks Protection Act. Canada has the Integrated Circuit Topography Act. Other countries are considering similar legislation.

United States Patent 4,667,016

Lai, et. al. May191987

Erythropoietin purification

Abstract

Chromatographic procedures are individually and jointly applied to the rapid and efficient isolation of biologically active proteins and especially glycoproteins such as recombinant erythropoietin present in the medium of growth of genetically transformed mammalian host cells. Illustratively, recombinant EPO is isolated from culture fluids by reverse phase chromatography employing a C(4) or C(6) column and elution with ethanol. Recombinant erythropoietin may also be purified by anion exchange chromatography employing, e.g., a DEAE resin, with preliminary selective elution of contaminant materials having a lower pKa than erythropoietin from the resin under conditions mitigating against acid activated protease degradation. Practiced serially, the two chromatographic procedures allow for high yields of biologically active recombinant erythropoietin from mammalian cell culture media.

Inventors: **Lai; Por-Hsiung** (Westlake Village, CA); **Strickland; Thomas W.** (Camarillo, CA).

Assignee: **Kirin-Amgen, Inc.** (Thousand Oaks, CA).

Appl. No.: **747,119**

Filed: **Jun.201985**

United States Patent **4,542,104**

***Stryer* , et al.** **September 17, 1985**

Phycobiliprotein fluorescent conjugates

Abstract

Fluorescent conjugates are employed providing combinations of a fluorescent sensitizer and a fluorescent phycobiliprotein. The conjugates find use in applications where large Stokes shifts, high absorption coefficients and high fluorescence quantum yields are desired. Particularly, combinations of phycobiliproteins are employed where the wavelength of excitation may be 50 nm or more different from the emission wavelength.

Inventors: **Stryer; Lubert** (Stanford, CA); **Glazer; Alexander N.** (Orinda, CA)

Assignee: **The Board of Trustees of the Leland Stanford Jr. Univ.** (Stanford, CA)

Appl. No.: **483006**

Filed: **April 6, 1983**

United States Patent

4,876,190

Recktenwald

October 24, 1989

Peridinin-chlorophyll complex as fluorescent label

Abstract

Peridinin-chlorophyll-protein complexes are provided for use as fluorescent labels and are particularly useful in diagnostic assays employing as a reagent a fluorescent compound conjugated to a member of a specific binding pair, wherein the pair consists of a biochemical ligand and a receptor and the diagnostic assay comprises a step in which the conjugate binds to its complementary binding-pair member.

Inventors: **Recktenwald; Diether J.** (Cupertino, CA)

Assignee: **Becton Dickinson & Company** (Franklin Lakes, NJ)

Appl. No.: **111209**

Filed: **October 21, 1987**

Stem cell marker CD34

invented by Curt Civin

patented by and assigned to

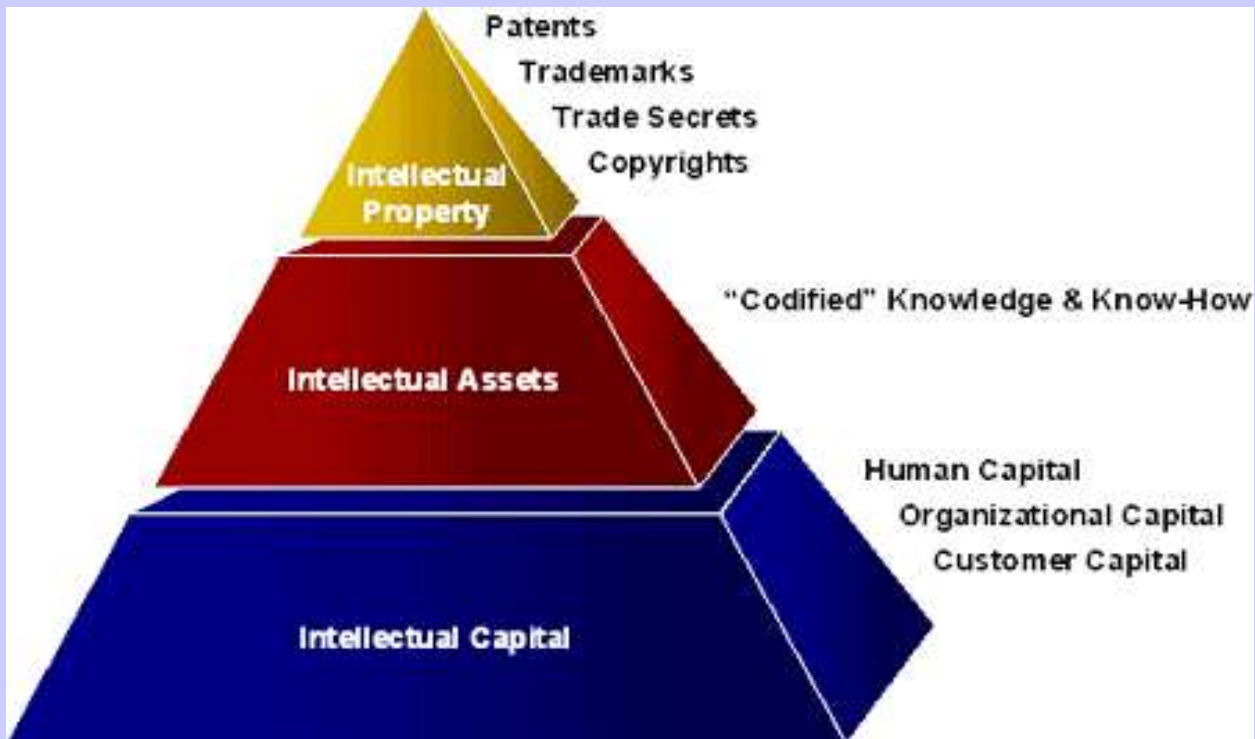
John Hopkin's University

licensed to Becton Dickinson

sublicensed for therapeutic use by Baxter

used to kill Cellpro, a M\$100+ company

Intellectual Value



From: Intellectual Asset Management - Maximizing Tangible Benefits from Intangible Assets , Deloitte & Touche, 2000

Question for small group discussion:

How will computer technology combined with the communication capabilities of the Internet help maximize the value of Intellectual Property, Intellectual Assets, and Intellectual Capital?

Yet2.com presentation here
before breakout discussion