



The Czechoslovak Society for
Forensic Genetics
stand
on the Czech DNA legal status

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www.cssfg.org

Lecture overview

- ⊕ Current *status quo*
- ⊕ Forensic genetics within genetics
- ⊕ Interest groups
- ⊕ Perceived risks
- ⊕ Hotspots: process view
- ⊕ ČSSFG
- ⊕ Conclusion

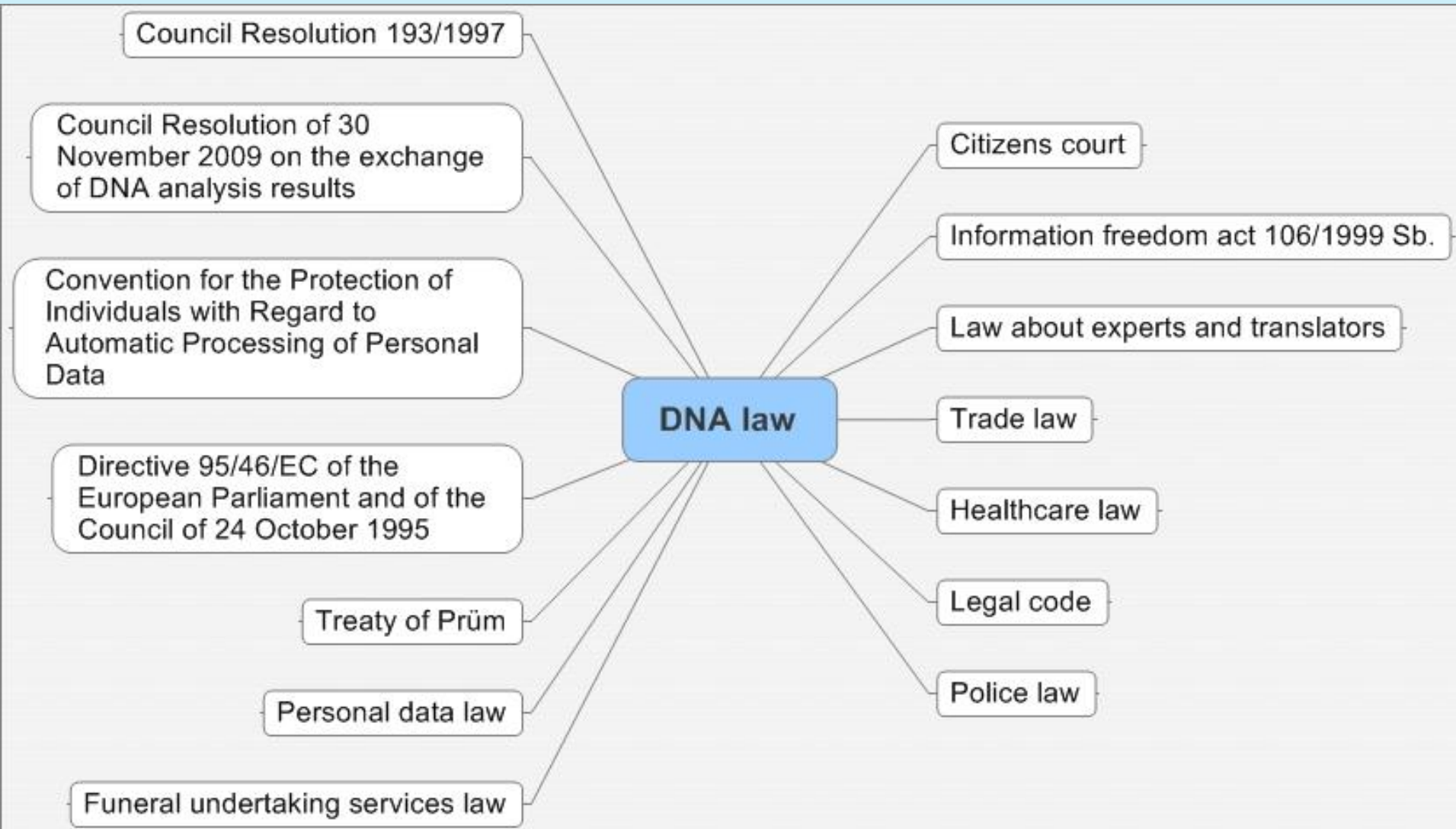
Current state of the affairs

- ⊕ Unclear rules
 - ⊕ restrictions from privacy law contradicts other laws
 - ⊕ motherless paternity testing performed
 - ⊕ differences in interpretation of the current law
- ⊕ Insufficient control
- ⊕ Technological development and risk from passivity



Need for a new law or adjustment of the current laws using expertise of CSSFG

Laws concerning DNA

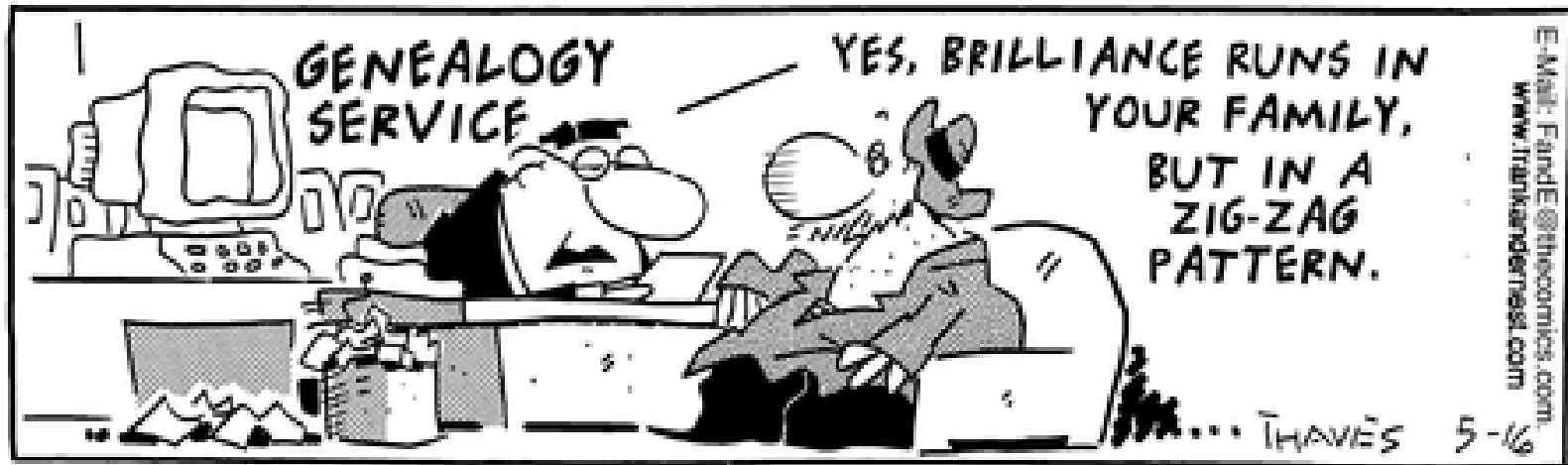




Genetic tests available

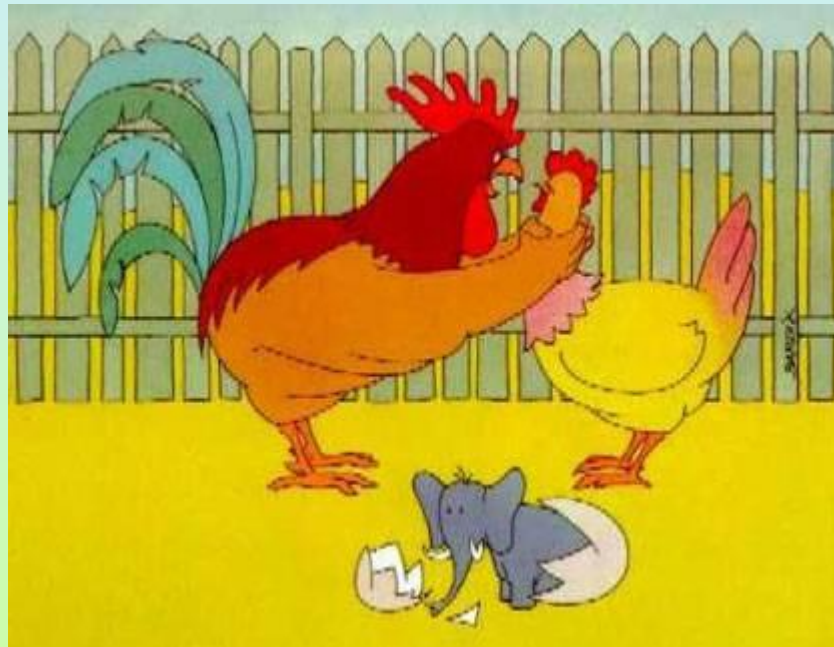
Genetic tests: genealogy

Frank and Ernest



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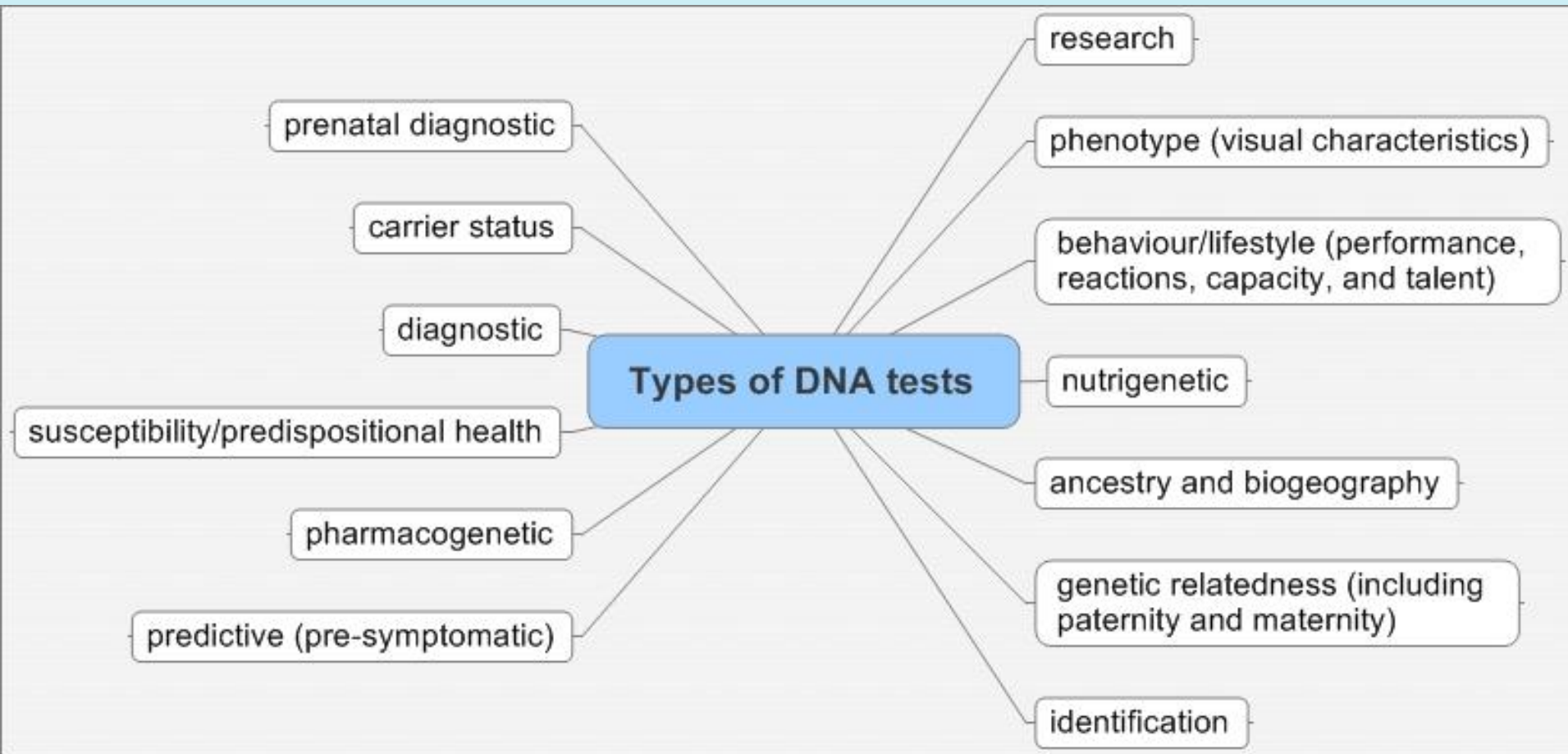
Genetic tests: paternity



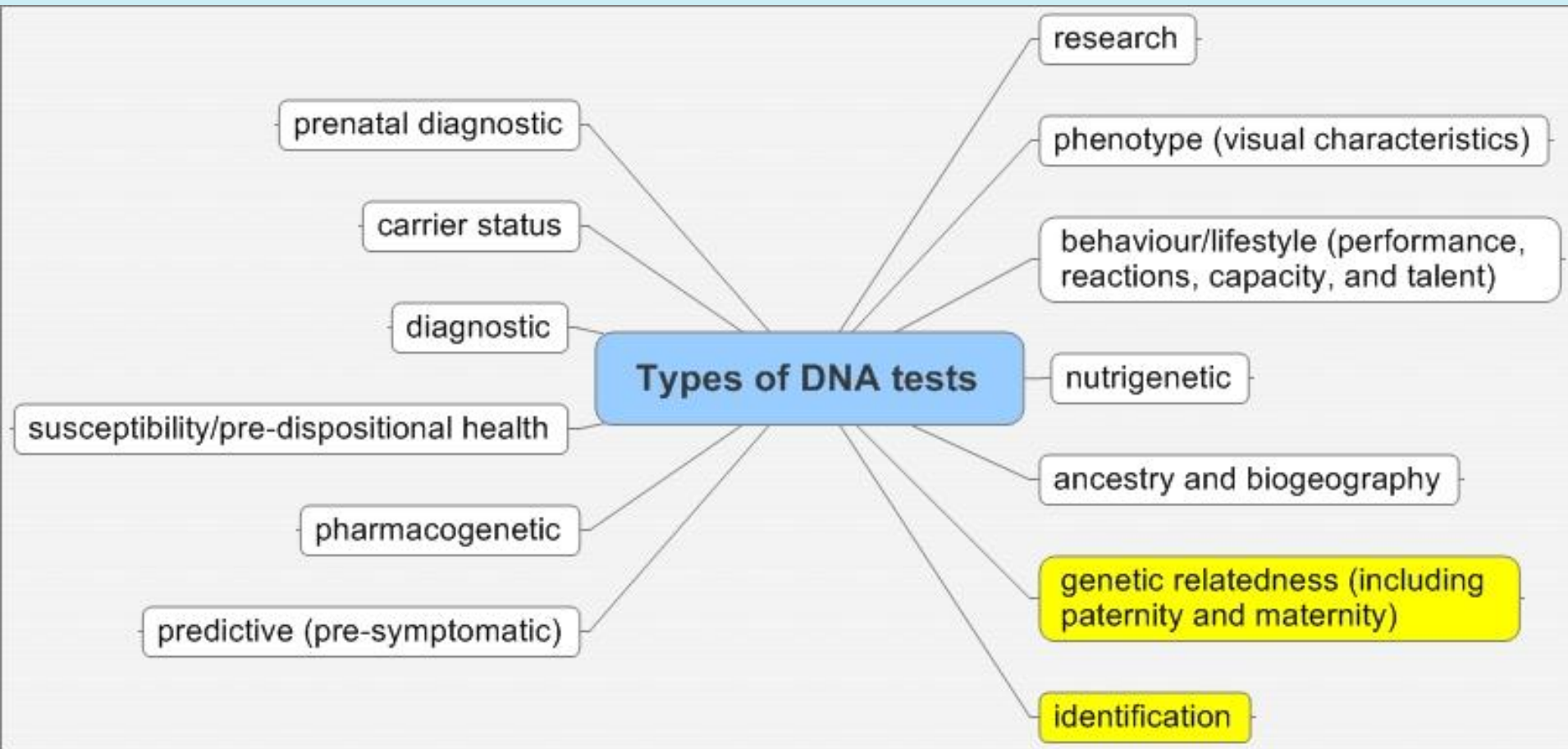
Genetic tests: forensics



Genetic tests available



Forensic genetics tests



Interest groups

- ⊕ Experts and expert institutions
- ⊕ Ministry of Interior → police → KÚP + OKTE
- ⊕ Ministry of Justice
- ⊕ The Office for Personal Data Protection (ÚOOÚ)
- ⊕ Citizen initiatives and privacy protection groups (Iuridicum Remedium and ombudsman)
- ⊕ Clinical genetics laboratories and private companies performing (i.e.: Generi-Biotech, Genomac, and LFG) and outsourcing (China)
- ⊕ ČSSFG and SLG ČLS JEP
- ⊕ Potential inspectors and clerks
- ⊕ (ČIA, universities, and Academy of Sciences)

- ⊕ Criminals



Perceived risks



Hans Memling



Untapped potential to fight crime

- ✦ Criminalistic DNA database is a primary tool against serious crimes (police and society)

VS.

- ✦ Misuse, breach of privacy and human rights
- ✦ Right to just process (ÚOOÚ, citizen initiatives and privacy protection groups, and society)



Insufficient control

- ⊕ Errors happen more often in genetic science, diagnosis, identification and/or kinship assessment
- ⊕ Genetic information can be misused
- ⊕ It may lead to persecution of innocent (ČSSFG, SLG ČLS JEP, ÚOOÚ, patients, potential inspectors, and society)

vs.

- ⊕ Backlog (police)
- ⊕ Increase in expenditures and low output (scientists, genetic labworkers, and commercial companies)
- ⊕ Rigidity (police, scientists, genetic labworkers, and commercial companies)



Technological development and risk from passivity

- Regulation is needed as ultra high throughput of genotyping methods allows Direct to Customer Genetics where information is provided from laymen to laymen (experts, clinical geneticists, and academics)

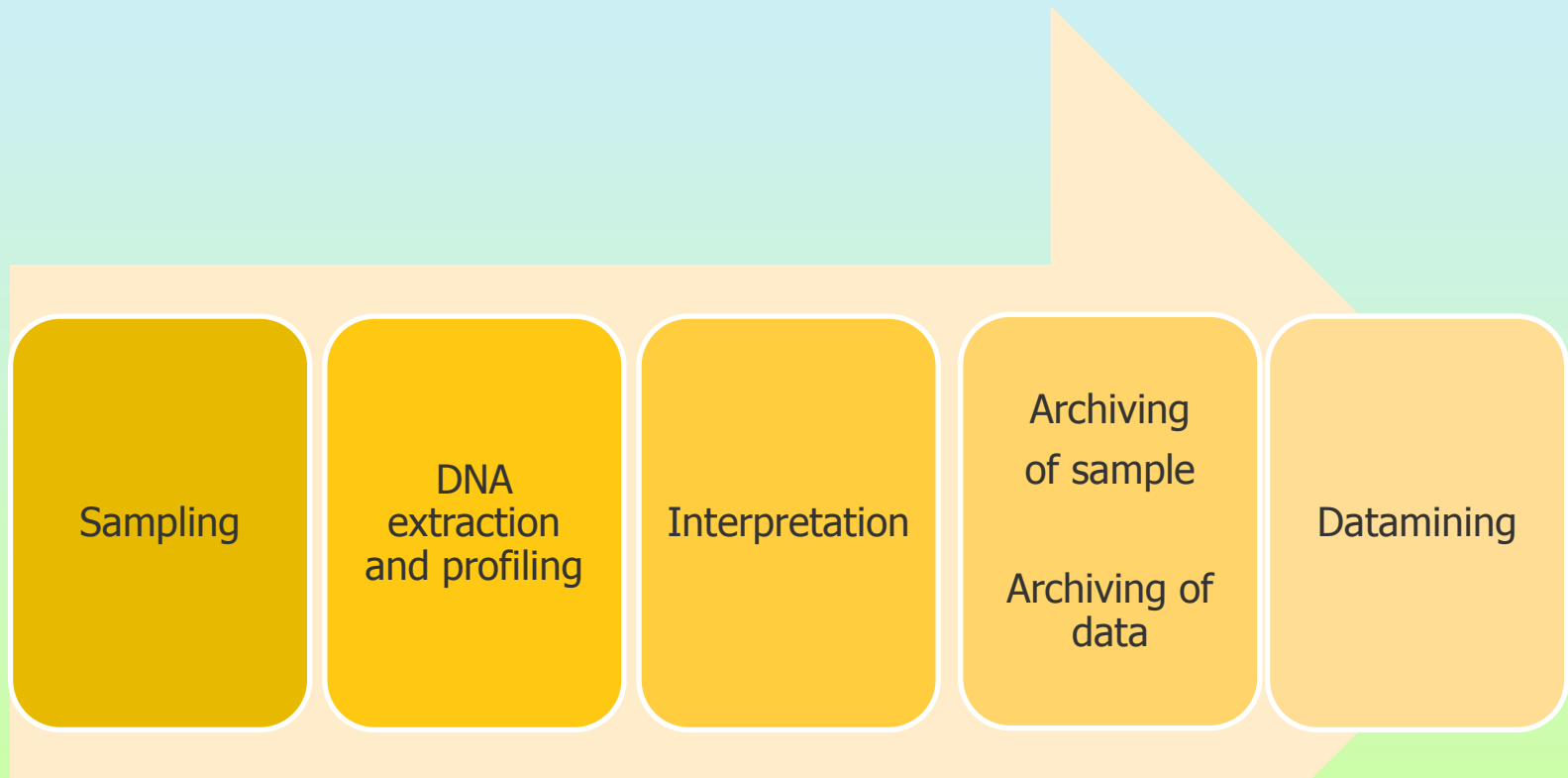
vs.

- Organized crime will access and misuse all the high tech without restriction (police)
- Too much restriction will lead to outsourcing and braindrain (companies, clinical geneticists, scientists, and early adopters)

Hotspots



Process view of DNA analysis



Contamination





Quality



Low quality leads to scary results

Sampling

- ⊕ **Who** (police and military police, prison guard, medical and forensic experts, medical doctors, certified persons, trade licensee, and law-enumerated persons – external control, certification, and accreditation)
- ⊕ **From whom** (criminals, suspects, traces, elimination samples, and children for paternity testing)
- ⊕ **Why** (for the sake of justice, civil law, health, personal curiosity, hobby, intelligence, and science)
- ⊕ **Ethics** (i.e.: advertisement, poison-letter, paternity testing, and test of infidelity)



Sampling

- ⊕ Standard sample (buccal swab, spit, and venal blood)
- ⊕ Trace
- ⊕ Microtrace – limiting amount of material (degraded and/or mixed)



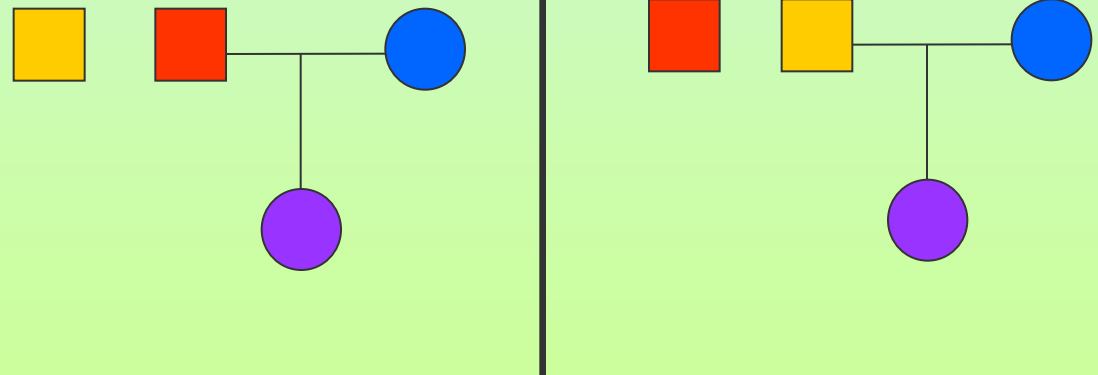
Interpretation

- ⊕ Admitted uncertainty
 - ⊕ ROC curve and Predictive value of test
 - ⊕ (Relative risk and absolute risk)
 - ⊕ Identification
 - ⊕ Paternity and kinship
 - ⊕ Mixtures
 - ⊕ Low input DNA

Interpretation

- ⊕ ACCE principles: analytical validity, clinical validity, clinical utility, and ethical principles
- ⊕ Transparency and Bayesian statistics approach

$$P(A|B) = \frac{P(B|A) P(A)}{P(B)}$$



Archiving

- ⊕ Archiving of biological samples and extracted DNA (criminalistic database vs. other database)
- ⊕ Archiving of DNA profiles (criminalistic database vs. other database)

- ⊕ Police, experts, and laboratories
- ⊕ Terms of storage
- ⊕ Possibility to re-analyse sample



Datamining

- ⊕ Population statistics
- ⊕ Looking for individual and looking for kin
- ⊕ Policeman, expert, scientist, and medical doctor
- ⊕ Possibility to re-examine the raw data (ISO)



ČSSFG working groups

- ⊕ **Sampling** (Bc. Jiří Myšinský)
- ⊕ **Persons** (RNDr. Hana Kolaříková)
- ⊕ **Laboratories** (doc. Mgr. Jiří Drábek, PhD.)
- ⊕ **Databasing** (RNDr. Marek Minárik, PhD.)
- ⊕ (doc. JUDr. Alexander Nett, CSc.)



ČSSFG priorities for DNA law

- ⊕ Compatibility with EU legislation
- ⊕ Robustness
- ⊕ Clear requirements, competencies, and responsibilities
- ⊕ Quality control and Quality assurance
- ⊕ Reproducibility, independent re-examination and re-analysis
- ⊕ Fight with serious crime, privacy protection, hindrance to misuse



ČSSFG work in progress

- ⊕ Code of ethics of forensic geneticist
- ⊕ Organization of external quality control
- ⊕ Project 4N6gen: Education in the field of forensic genetics
- ⊕ Guidelines for method validation, requirements for forensic experts and forensic laboratories, guidelines for mixture analysis, guidelines for interpretation of paternity testing



What should cover DNA law

- ⊕ Requirements for sampling, processing, interpretation, archiving, datamining of DNA and DNA profiles
- ⊕ Technical and administrative requirements for experts and expert assessments
- ⊕ Requirements for persons and laboratories carrying on DNA analysis
- ⊕ Independent procedures for control of compliance with the rules.

Expected gain

- ⊕ Fulfilling the potential of DNA analysis
 - ⊕ Providing exact information
 - ⊕ Both convictions and exonerations
- ⊕ Better control → better quality
- ⊕ Lower risk of misuse
- ⊕ Balanced human rights
- ⊕ Clear and transparent rules for science and market
- ⊕ Citizen trust in forensic genetics

- ⊕ (Financial requirements)

Conclusion

Although ČSSFG members belong to all types of interest groups (working in universities, hospitals, police labs, and private labs), they agree on:

- ⊕ the need for the comprehensive DNA law addressing all the aspects of DNA processing
- ⊕ the notion that ČSSFG is ready to consult such law
- ⊕ ČSSFG is ready to guarantee the technical quality of forensic genetics tests

Thank you for your attention!

