

# **Precision Medicine Development**

## ***A Model of the Informed Allocation of Therapy for Complex Adult Solid Tumors***

**Eleni Efsthathiou, M.D. PhD**

THE UNIVERSITY OF TEXAS  
**MDAnderson**  
**Cancer Center**

Making Cancer History®

**DAVID H. KOCH CENTER  
FOR APPLIED RESEARCH OF  
GENITOURINARY CANCERS**



**University of Athens  
Medical School  
Dept of Clinical Therapeutics**

# ***Current Medical Practice***

**Reactive Medicine**

**Symptom**



**Diagnosis**



**Treatment**  
**“One fits all”**

# ***Precision Medicine delivered***

***Right treatment strategy at the right dose at the right time, with minimum ill consequences and maximum efficacy***

# **Status of Therapy Development For Complex Adult Solid Tumors**

***Design of studies largely based on  
uniform prognostication***

***“Incremental progress” suggests  
conceptual framework will need to be  
reexamined!***

# Precision Medicine

***Hypothesis:***  
***Integration biologic***  
***understanding with clinical***  
***context will lead to***  
***individualized treatment***  
***strategy.***

# ***Precision Medicine Requirements***

## ***Knowledge Network for Biomedical Research***

*Integrating :  
Molecular Characterisation  
& Clinical Data*



## ***New Taxonomy of Disease***



**Biomedical Research**

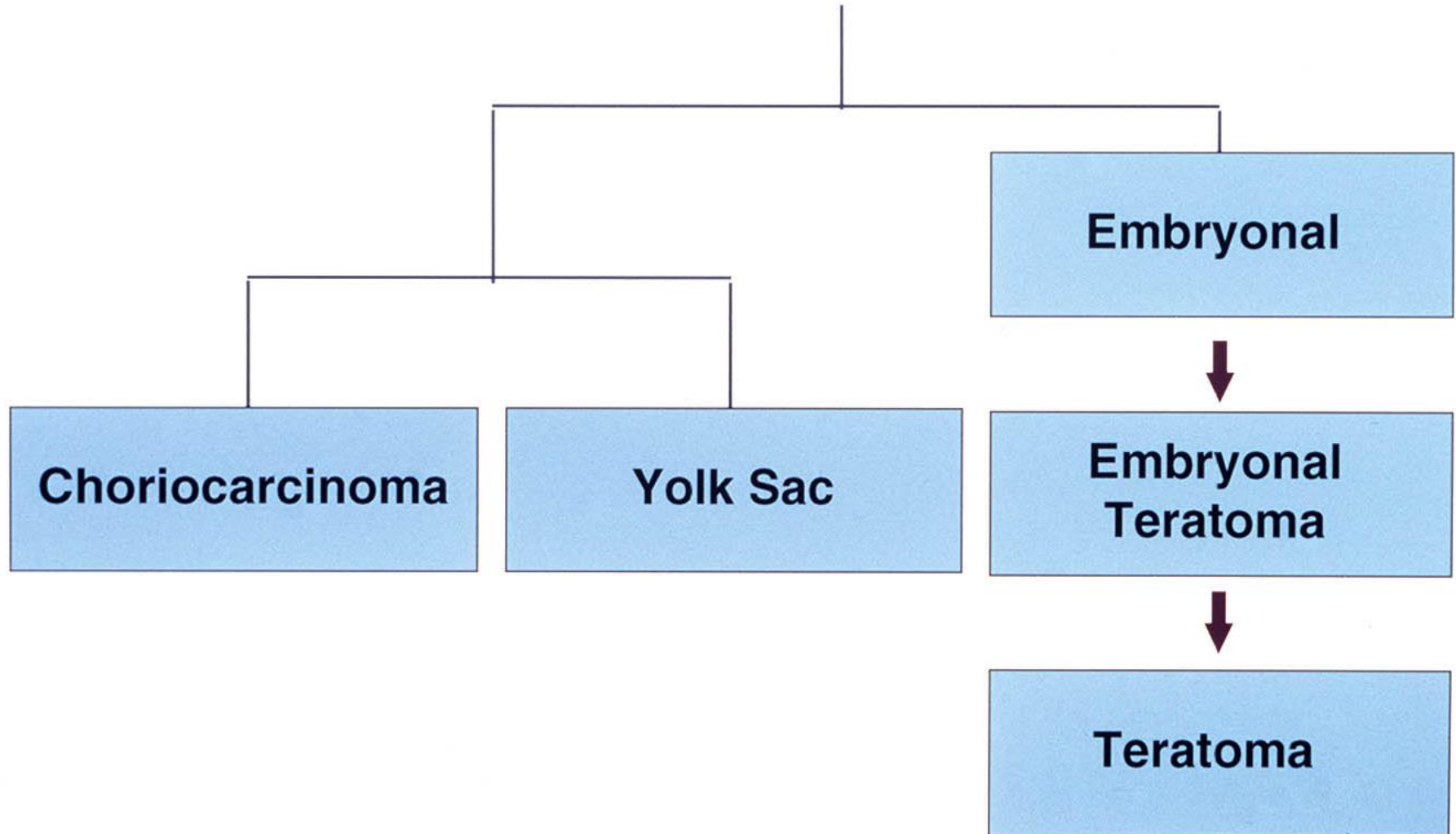


***Clinical Medicine***



**Example of successful  
Taxonomy  
Germ Cell Cancers**

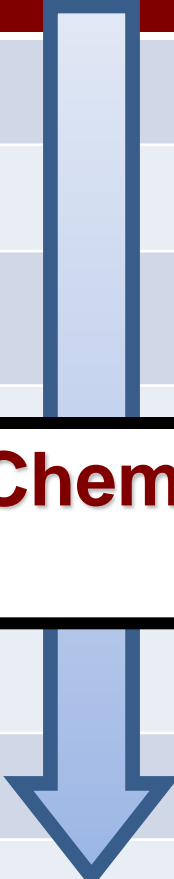
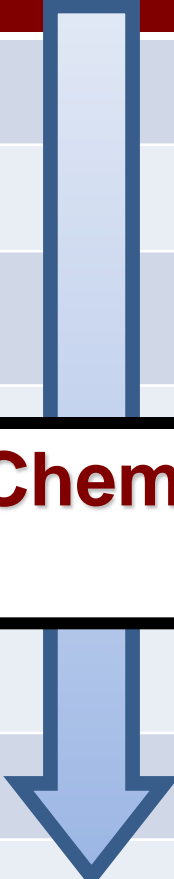
# **Seminoma (Germinoma)**



# Predictive Markers

**Biology of primary as reflected  
in histology predicts curative  
potential to specific therapies.**

# Impact of Chemotherapy

Survival	1974	NSGCTT Non Seminomatous			
43%		PVB	Vs	PVA B	No Δ
		PVB ↑ (dose)	Vs	PVB	No Δ
		CISCA/VA (80%)	Vs	CISCA/VB (100%)	No Δ
		PEB	Vs	PVB	No Δ
		VAB6	Vs	BEP	No Δ
		PEB	Vs	EP	Inferior
		CEB	Vs	PEB	Inferior
85%	1993				

**Is Chemotherapy solely responsible for survival improvement?**

# Successful Paradigm



# Germ Cell Tumor as Successful Paradigm (Domains of Progress)

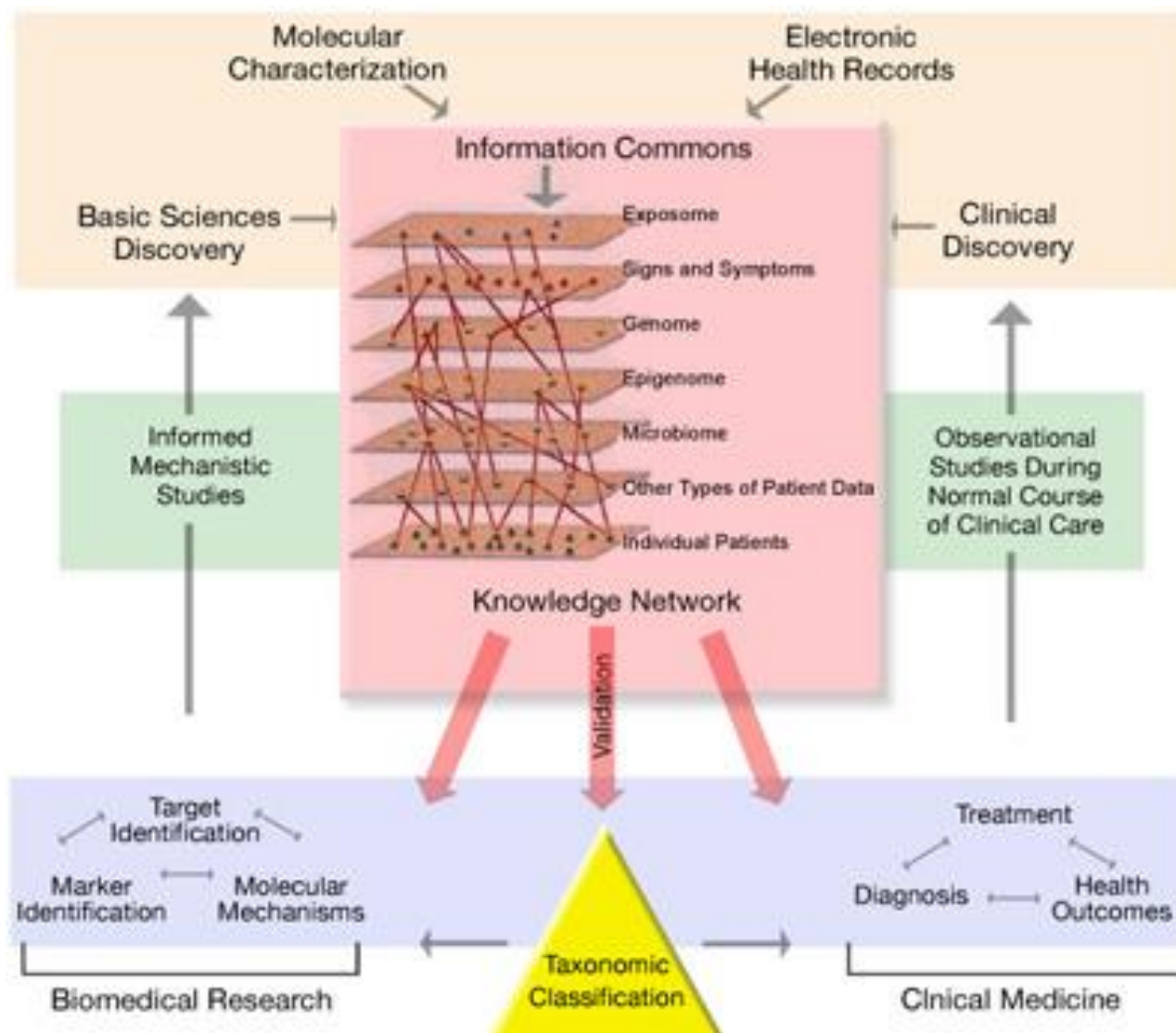
- 1) Therapeutic relevant taxonomy.
- 2) Effective therapeutics: chemotherapy, radiation and surgery
- 3) Robust predictive markers led to the transition from drug development to precise allocation of therapy strategies

***Marker informed treatment strategy leads to a curative and “precise treatment” by integrating advances in all three domains***

# Question

**Is germ cell tumor paradigm applicable to other common adult solid tumors?**

# Precision Medicine Requirements



# ***Precision Medicine Delivered***

**Understand**

Integrate Knowledge  
Identify / Classify  
findings

**Anticipate**

Enable Risk Assessment

**Cure/  
Secondary  
Prevention**

Treat based on Taxonomy  
AND patient characteristics

***Right** treatment strategy at the **right** dose at  
the **right** time, with minimum ill consequences  
and maximum efficacy*