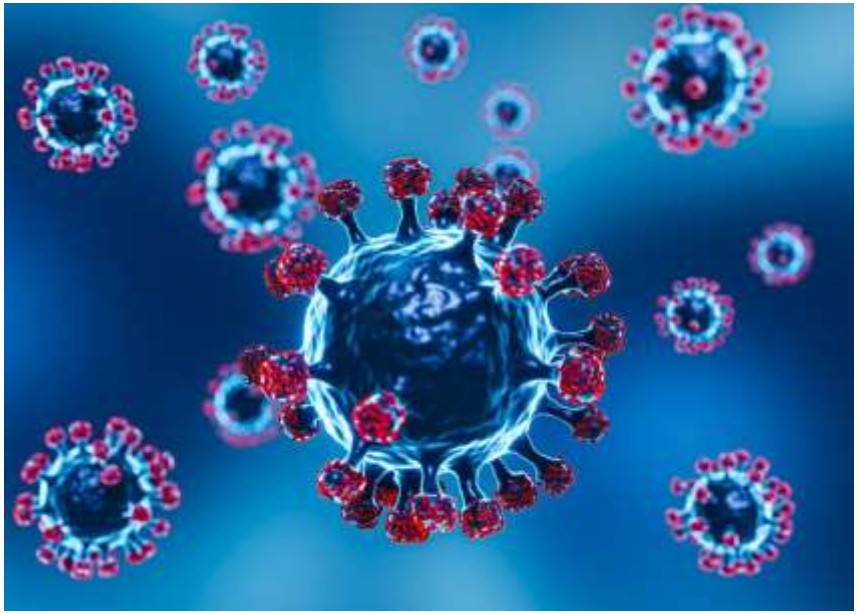
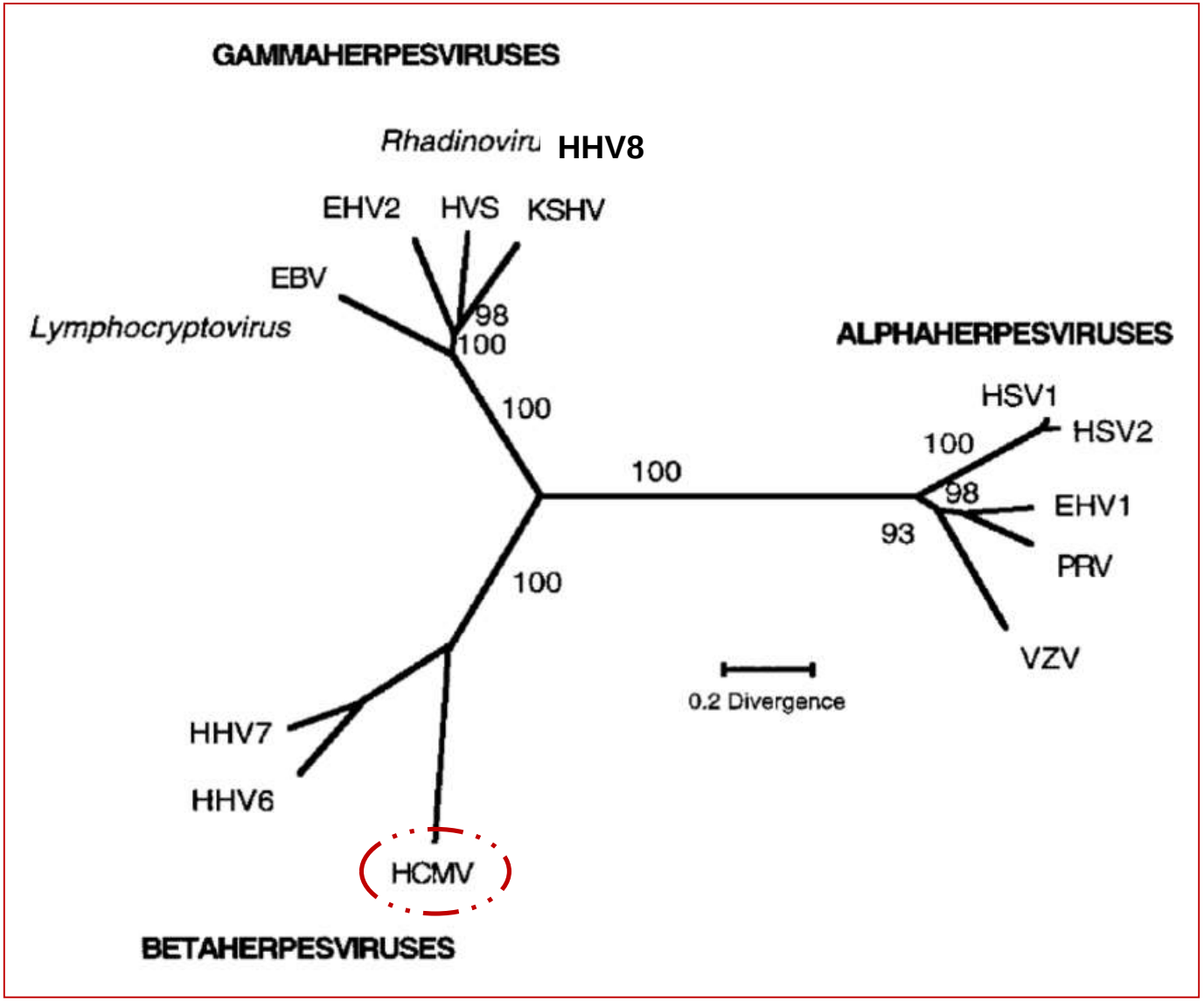


CMV TANI YÖNTEMLERİNDE YENİLİKLER
PCR dan Quantiferona

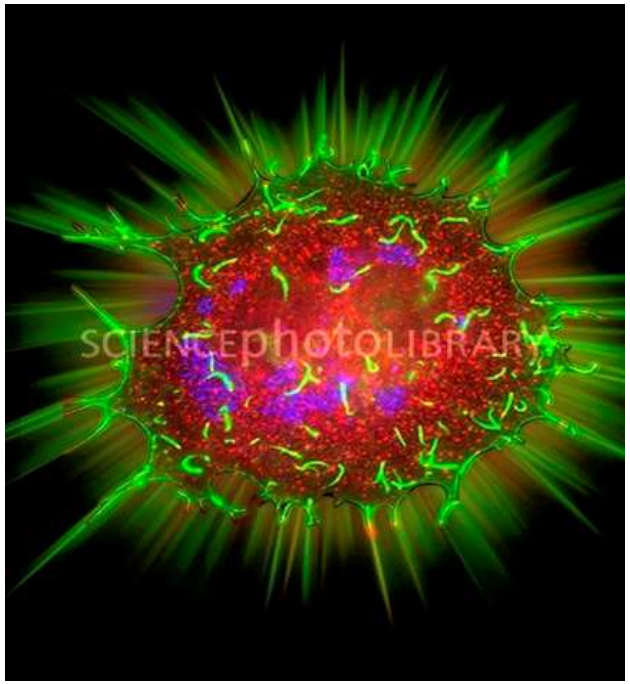
Hande Arslan

Başkent ÜTF / 25.04.2025

HERPES VİRUS AİLESİ



CMV



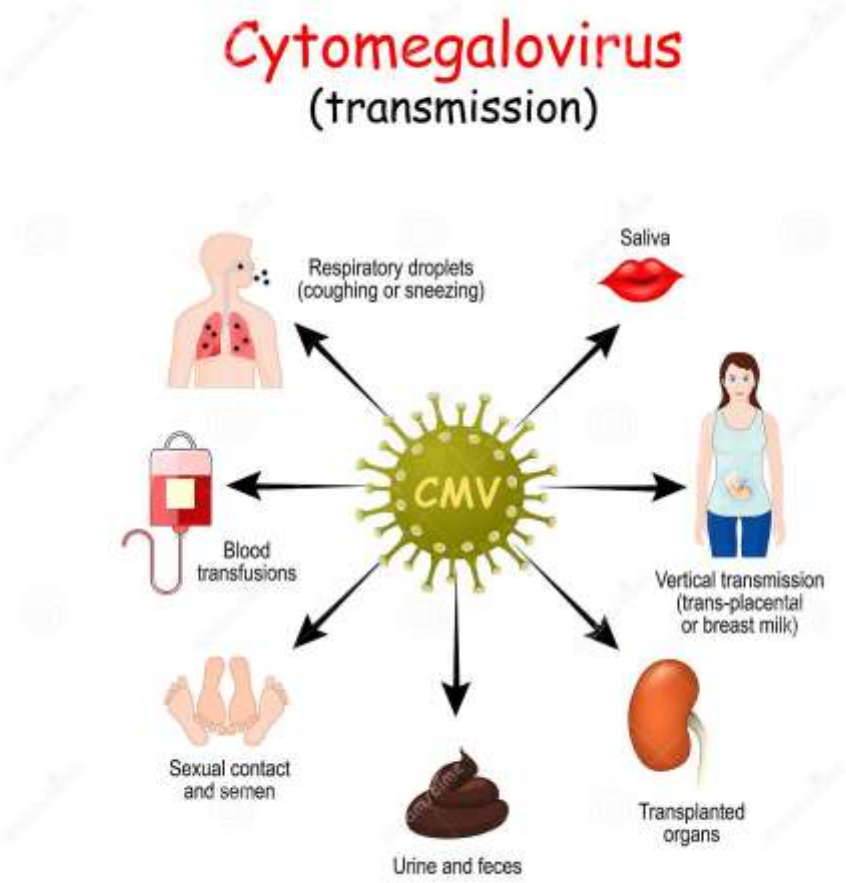
- Çok eski, evolusyoner,
- Latent

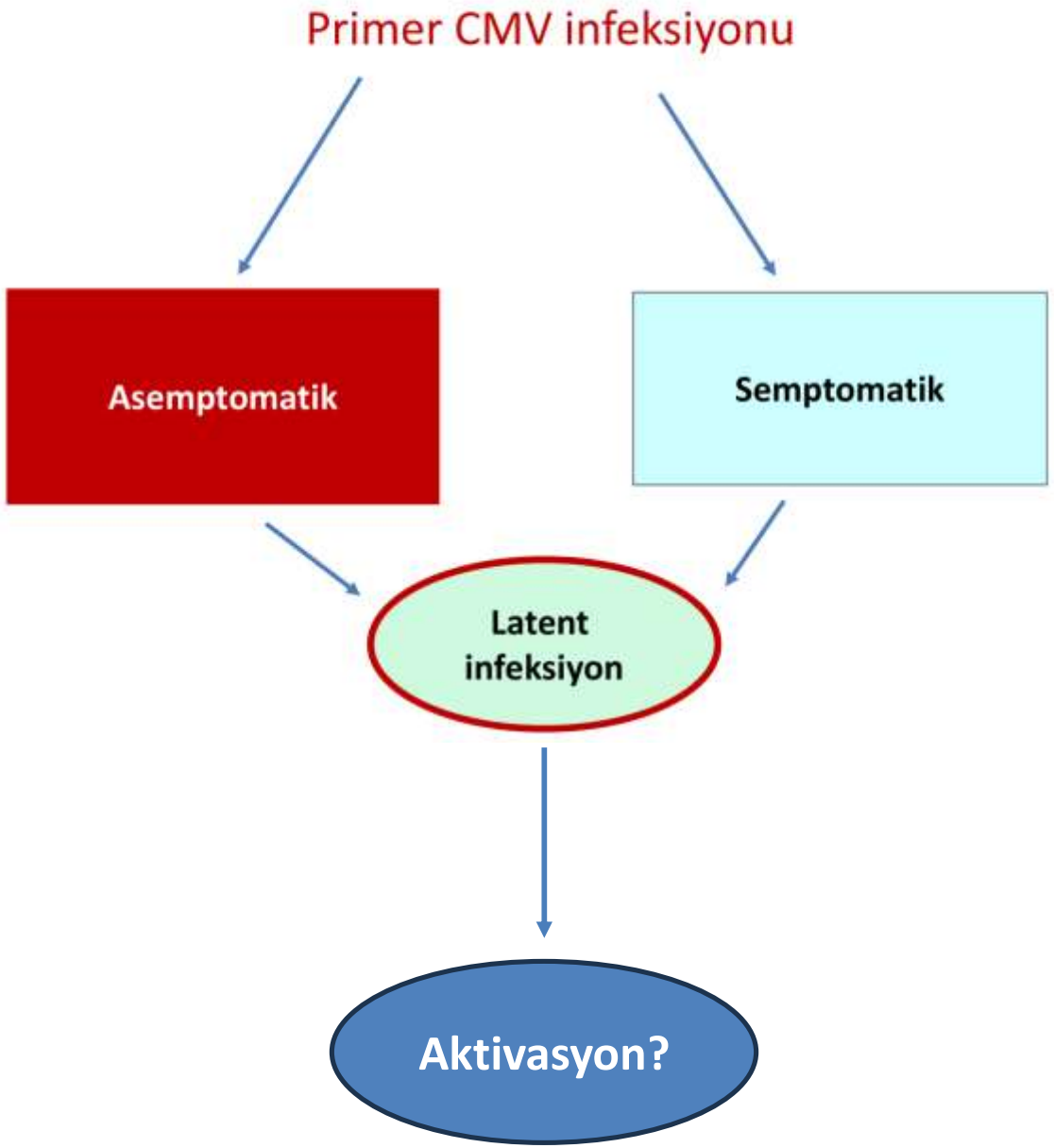
- İnsan (HCMV)

- Gine domuzu
- Fare
- Rat
- Hemster
- Şempanze
- Rodentler

HCMV

- Gelişmiş ülkelerde %60
- Gelişmekte olan ülkelerde %90 seropozitif




Primer CMV infeksiyonu
Asemptomatik
Semptomatik
Latent infeksiyon
Aktivasyon?

CMV aktivasyonu kimlerde görülür?

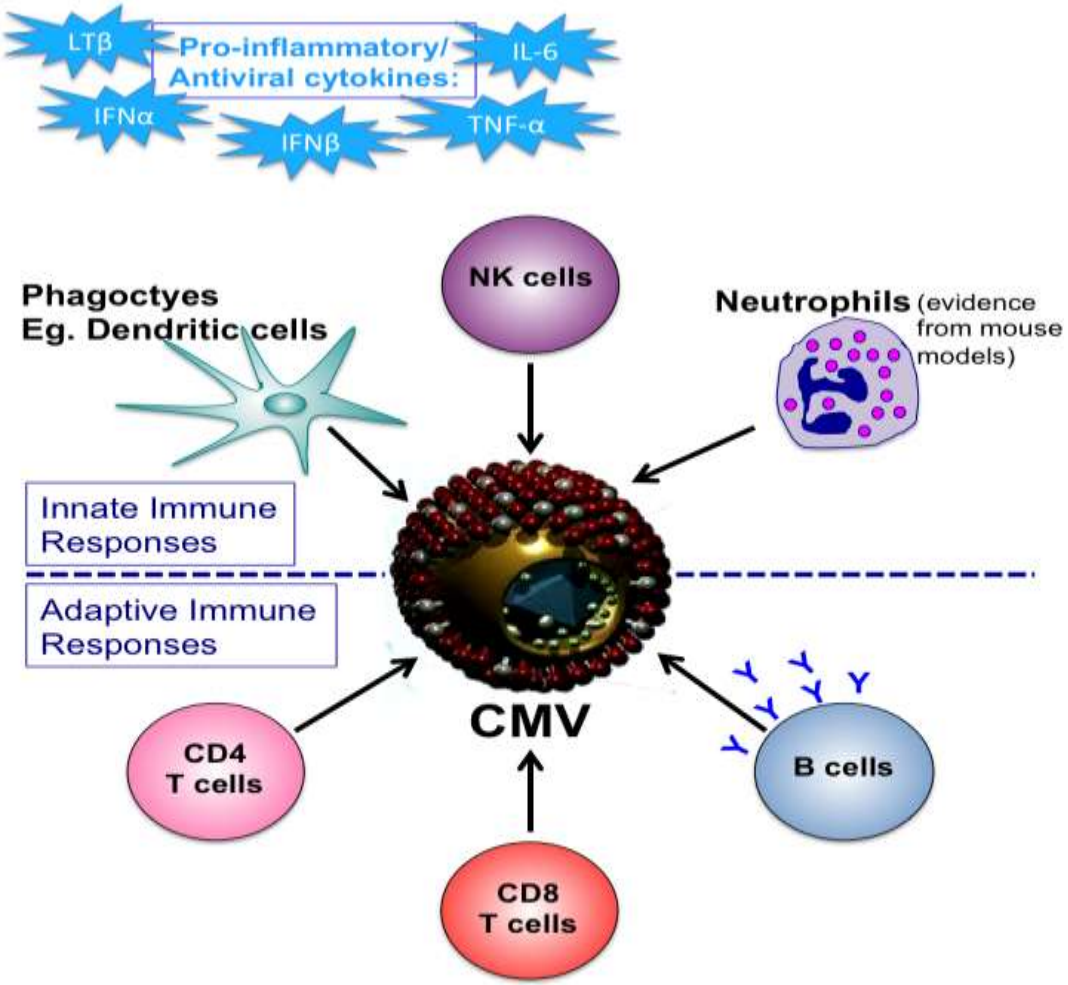
- Solid Organ Nakli Hastaları
- Kök Hücre Nakli hastaları

- AIDS hastaları

- Onkolojik maligniteler
- Septik şok hastaları/ Yanık hastaları
- İnflamatuvar barsak hastalıkları
- Otoimmun hastalıklar

- ‘İmmünosenesens’

LATENT İNFEKSİYON REAKTİVASYONU



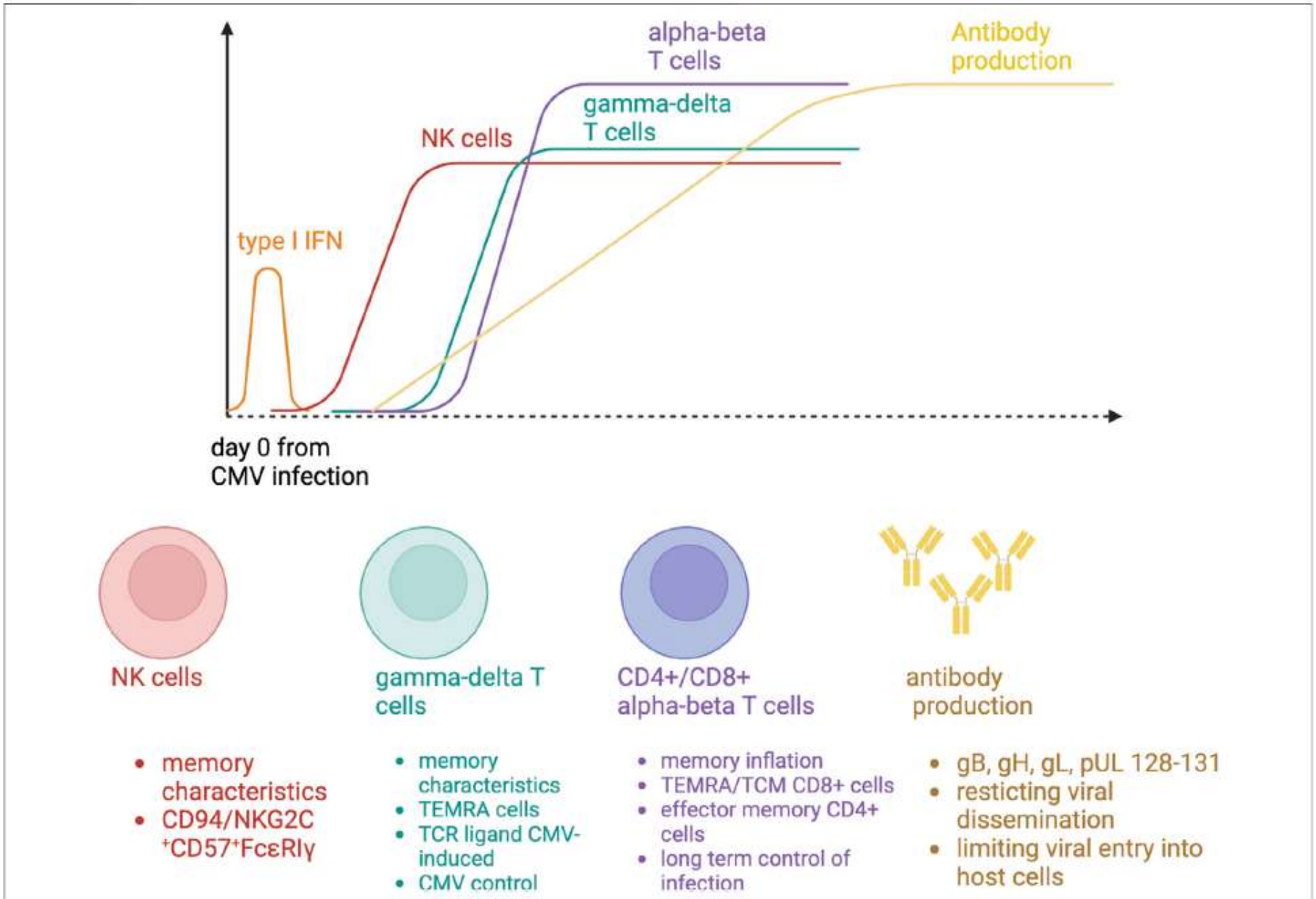


FIGURE 1 | Immune responses to cytomegalovirus primary infection.

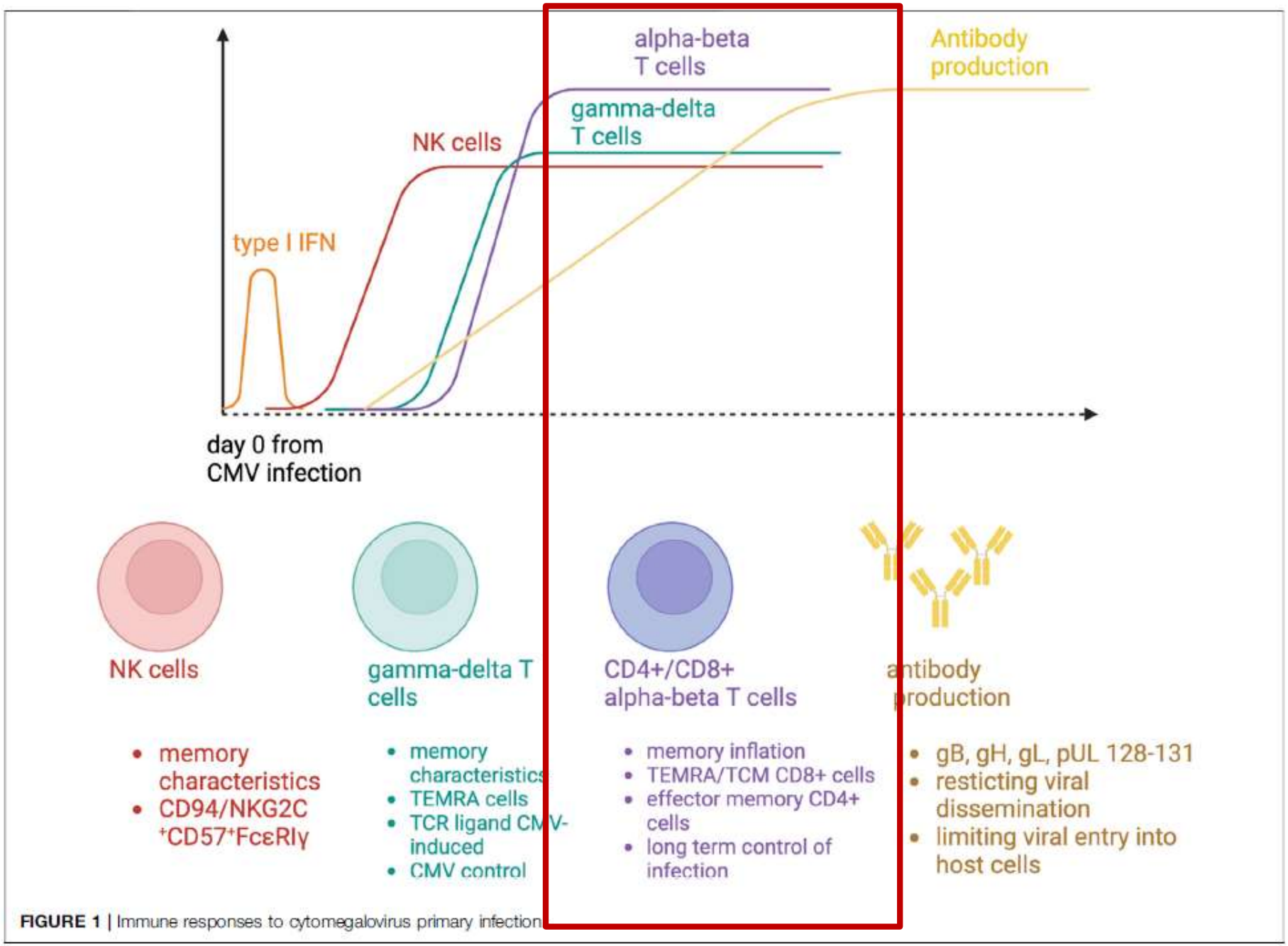
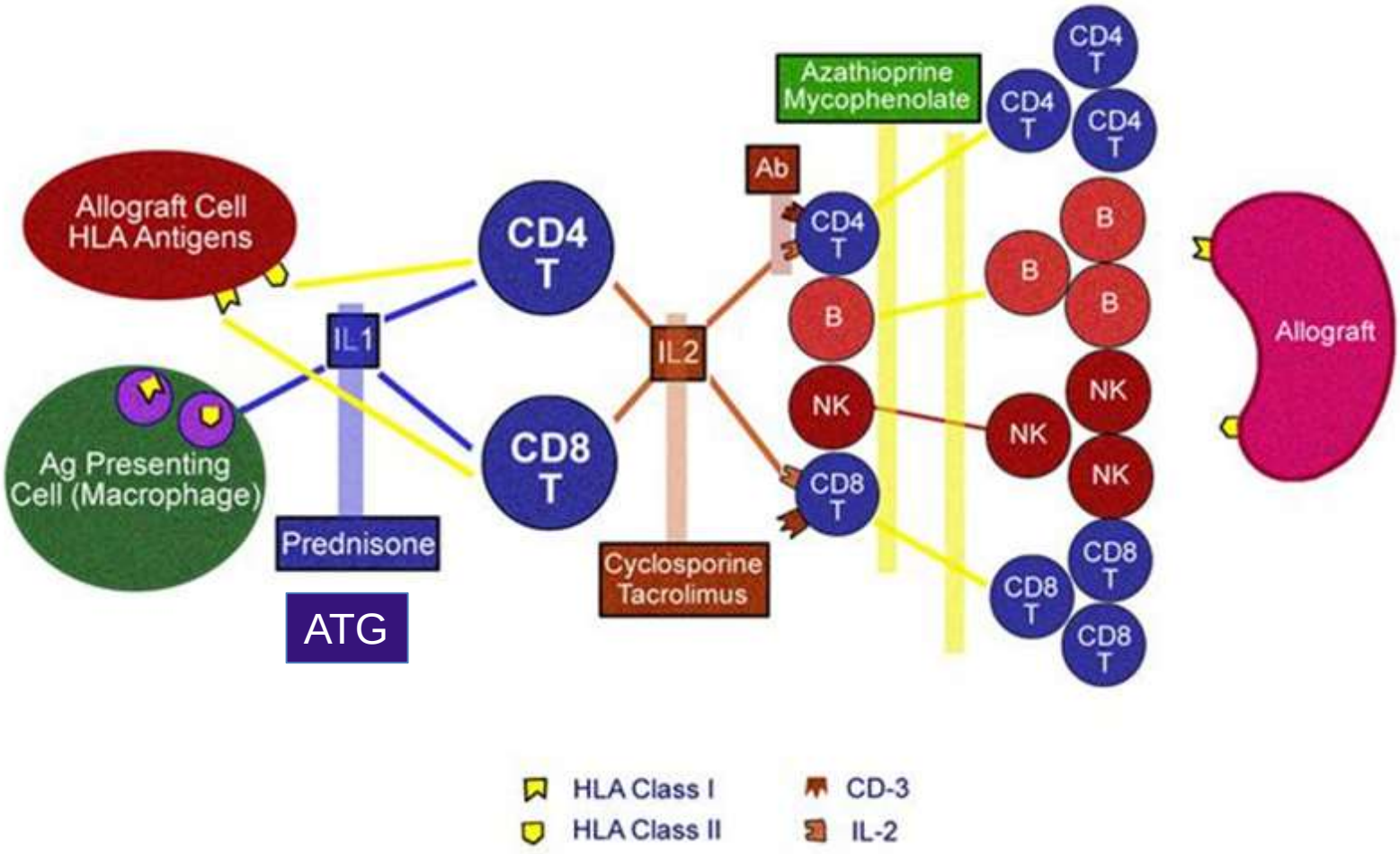
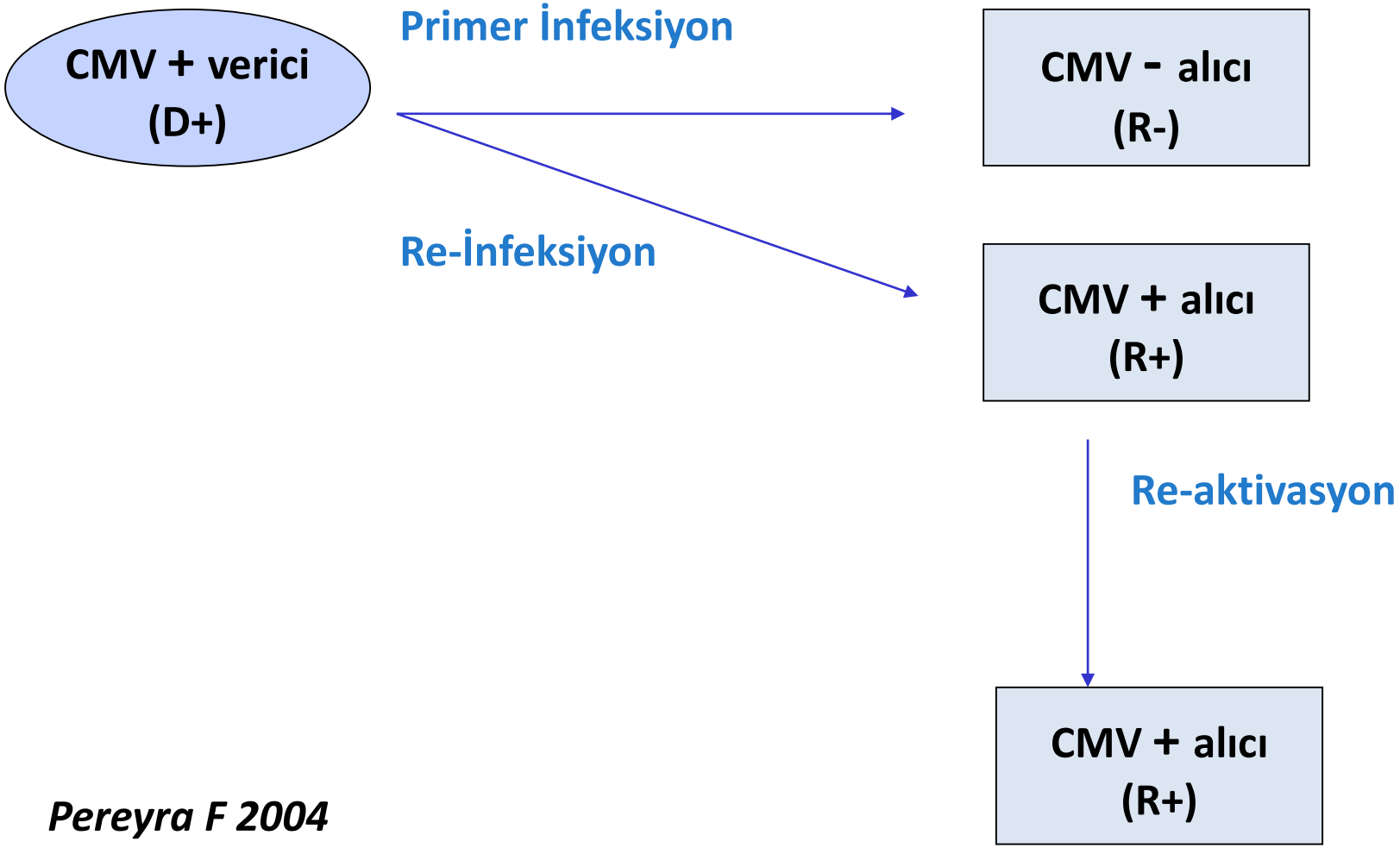


FIGURE 1 | Immune responses to cytomegalovirus primary infection

Nakil alıcılarında CMV reaktivasyonu

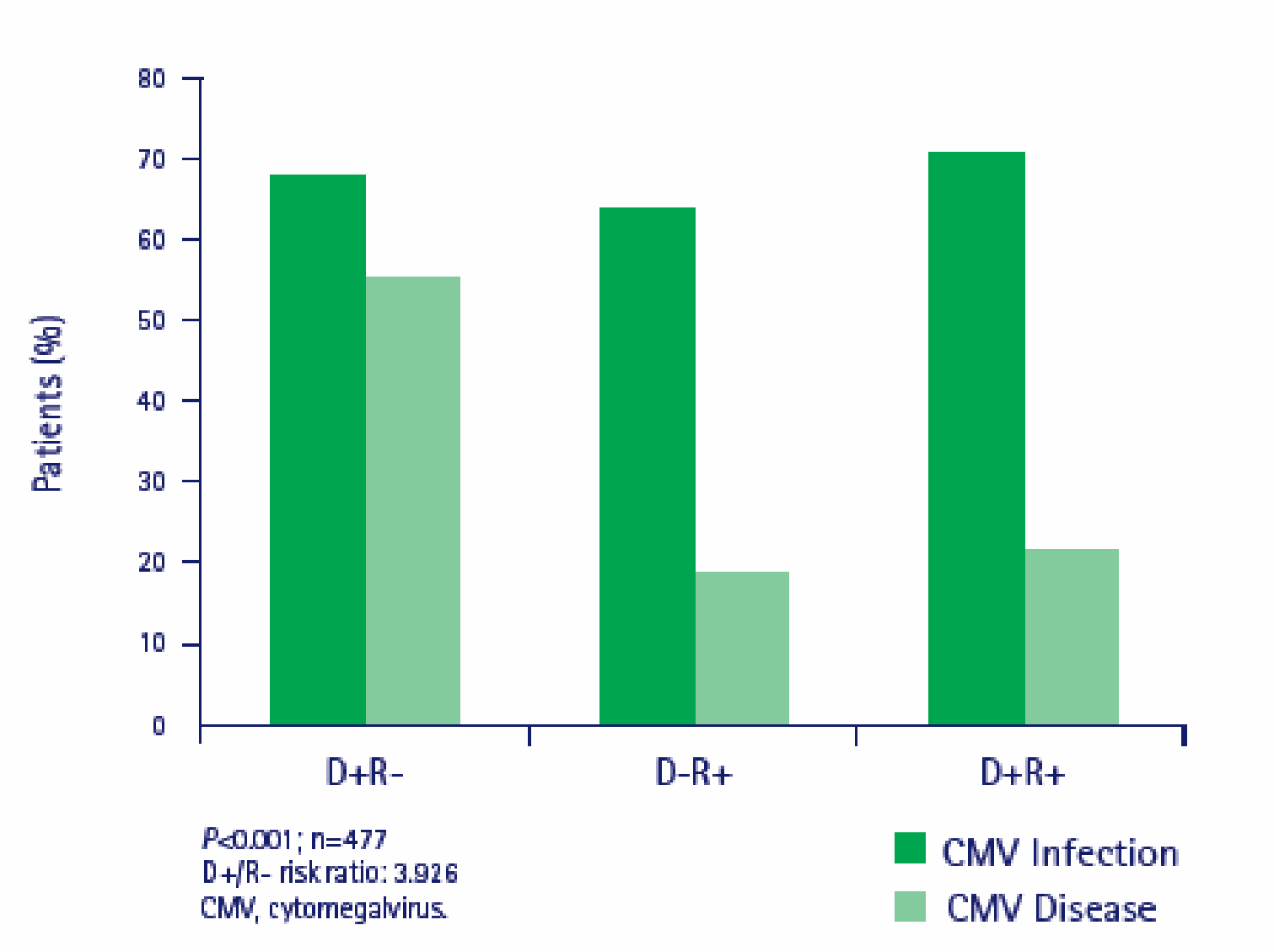

Allograft Cell
HLA Antigens
Ag Presenting
Cell (Macrophage)
IL1
Prednisone
ATG
CD4
T
CD8
T
IL2
Cyclosporine
Tacrolimus
Ab
CD4
T
B
NK
CD8
T
Azathioprine
Mycophenolate
CD4
T
CD4
T
CD4
T
B
B
B
NK
NK
NK
CD8
T
CD8
T
CD8
T
Allograft
HLA Class I
HLA Class II
CD-3
IL-2

Nakil alıcılarında CMV İnfeksiyonları



Pereyra F 2004

Renal TX alıcılarında reaktivasyon/ hastalık riski



Hartmann A et al. Transplantation 2006

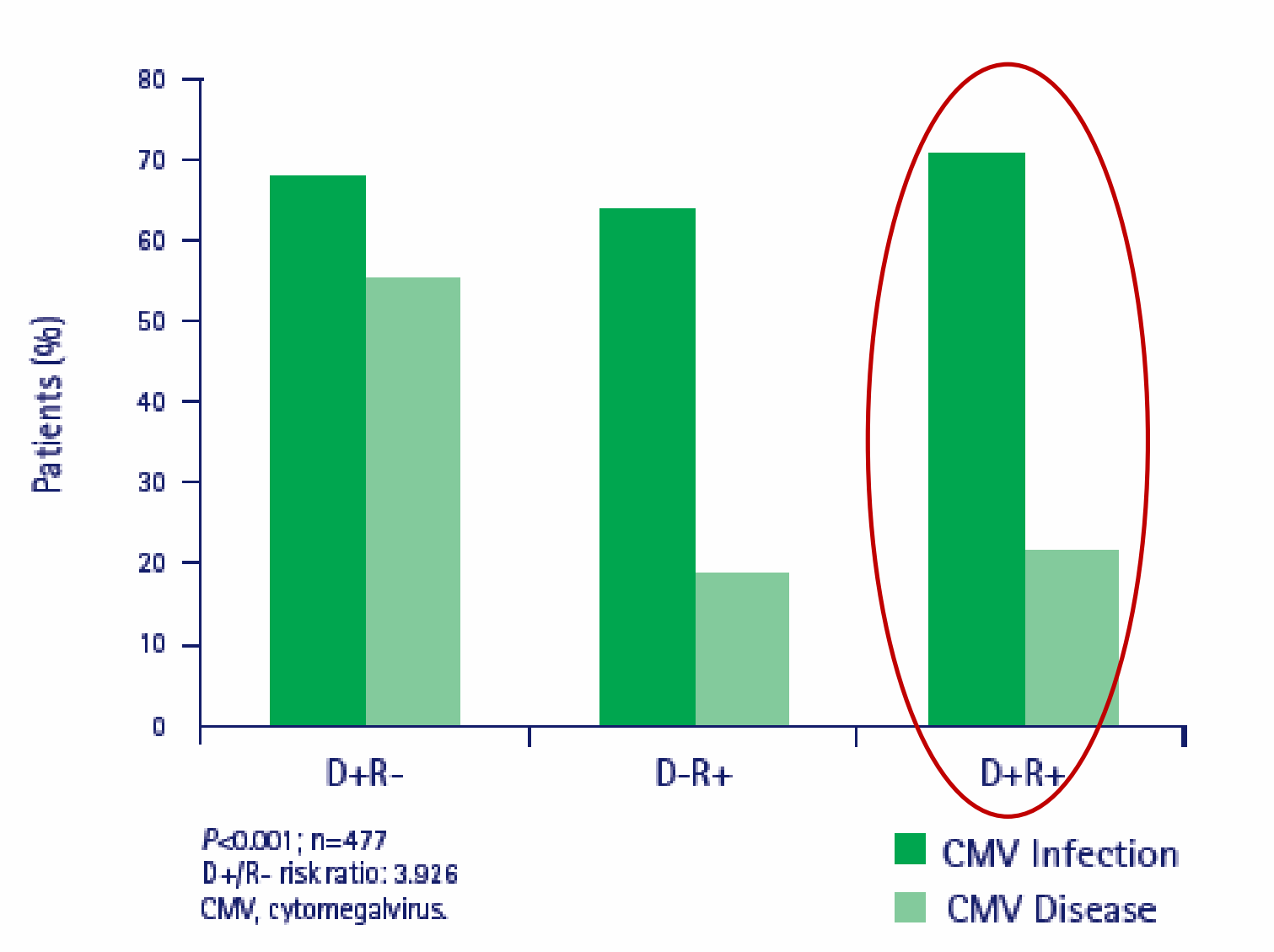
Başkent Karaciğer/ Böbrek Alıcı verici Serolojik Durumları

2015-2024 N=866	Anti-CMV IgG +	Anti-CMV IgG -
Verici (D)	859 (%99,2)	7 (%0,8)
Alıcı (R)	843 (%97,35)	23 (%2.65)

2015-2024 N=23	<15 Yaş	>15 yaş
Seronegatif Alıcı	17 (%74)	6 (%25)

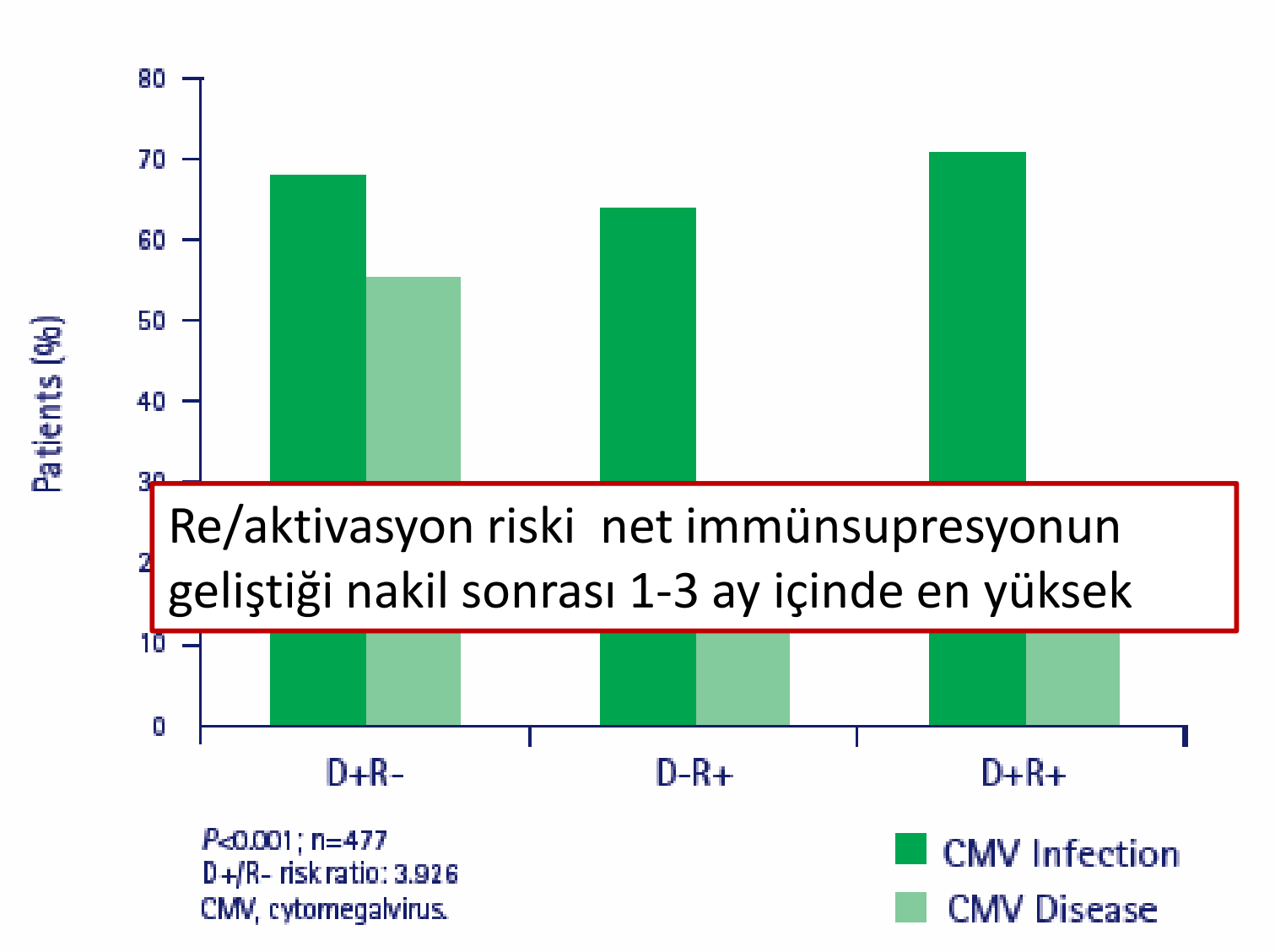
Başkent Erişkin Organ Alıcı Verici Serolojisi D+/R+

Renal TX alıcılarında reaktivasyon/ hastalık riski



Hartmann A et al. Transplantation 2006

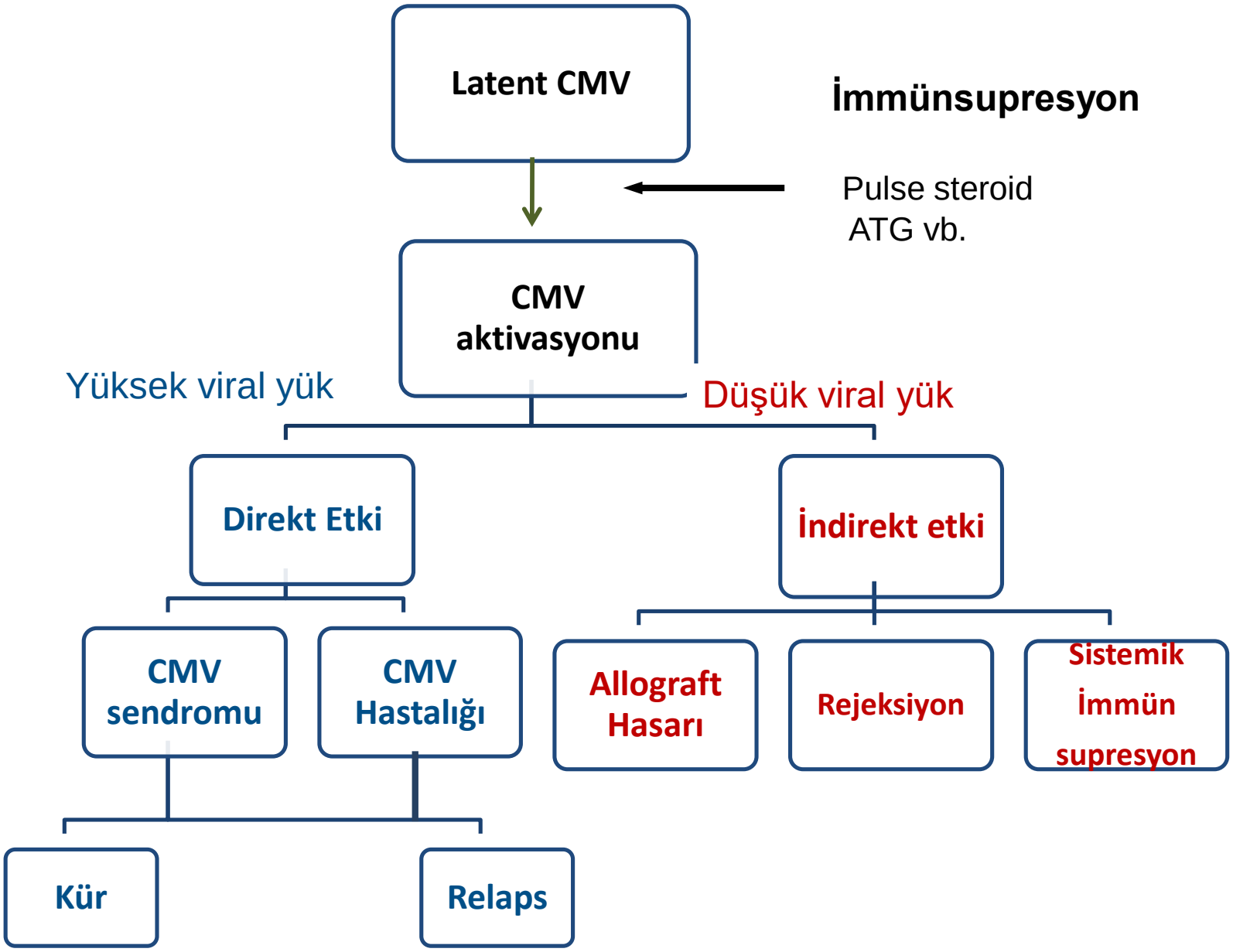
Renal TX alıcılarında reaktivasyon/ hastalık riski



Re/aktivasyon riski net immünsupresyonun geliştiği nakil sonrası 1-3 ay içinde en yüksek

Hartmann A et al. Transplantation 2006

CMV reaktivasyonu sonuçları



CMV yönetimi

Amaç

- CMV rektivasyonunun kontrol altına alınarak direkt/indirekt zararların ortadan kaldırılması;
  - **Proflaksi**
  - **Preemptif tedavi**
- Gelişen CMV hastalığının tedavisi ve relapsın önlenmesi

Reaktivasyon /hastalık tanısında kullandığımız teknikler

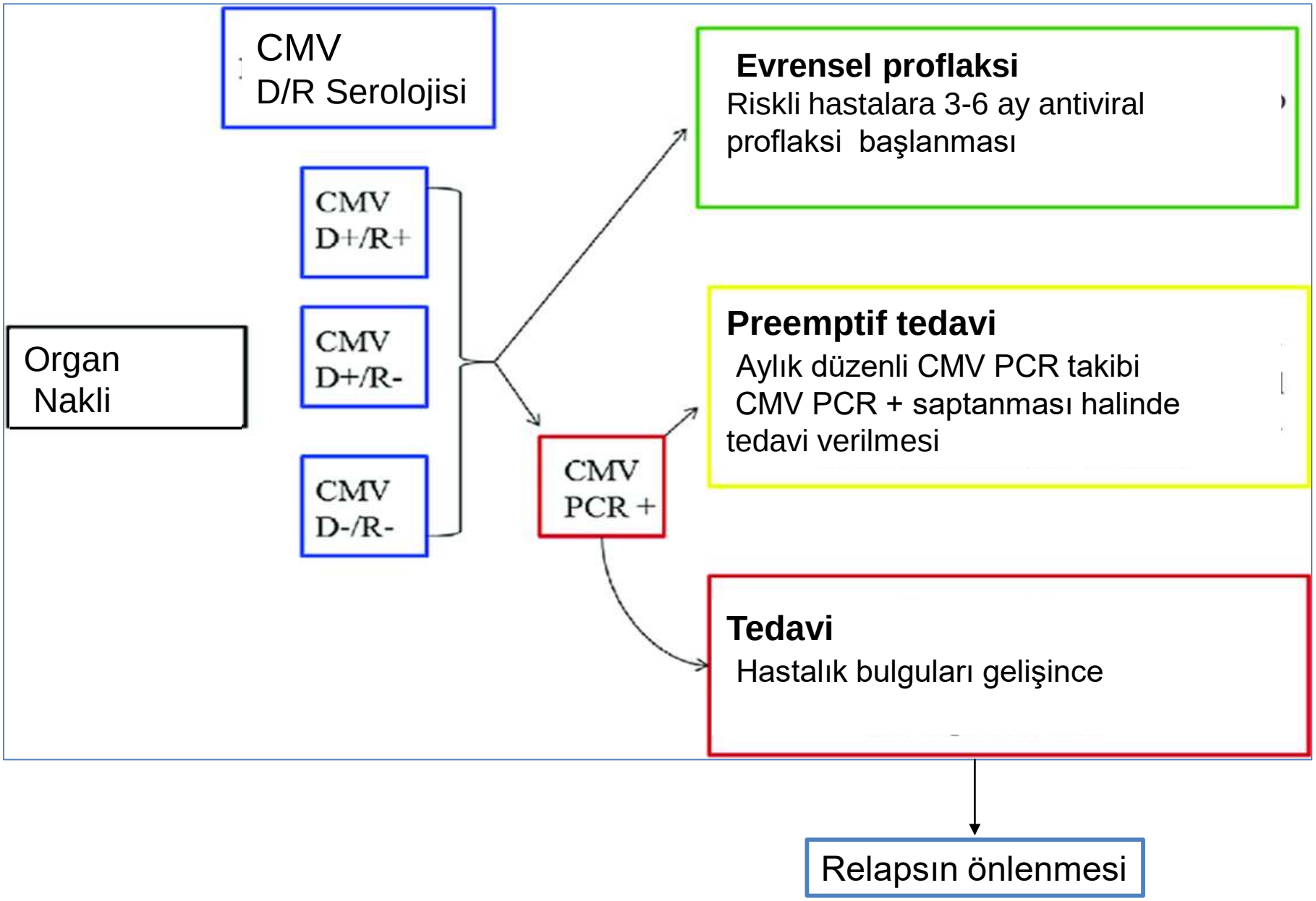
Seroloji

- Nakil öncesi adayın durumunu belirleme
- çok kısıtlı katkı

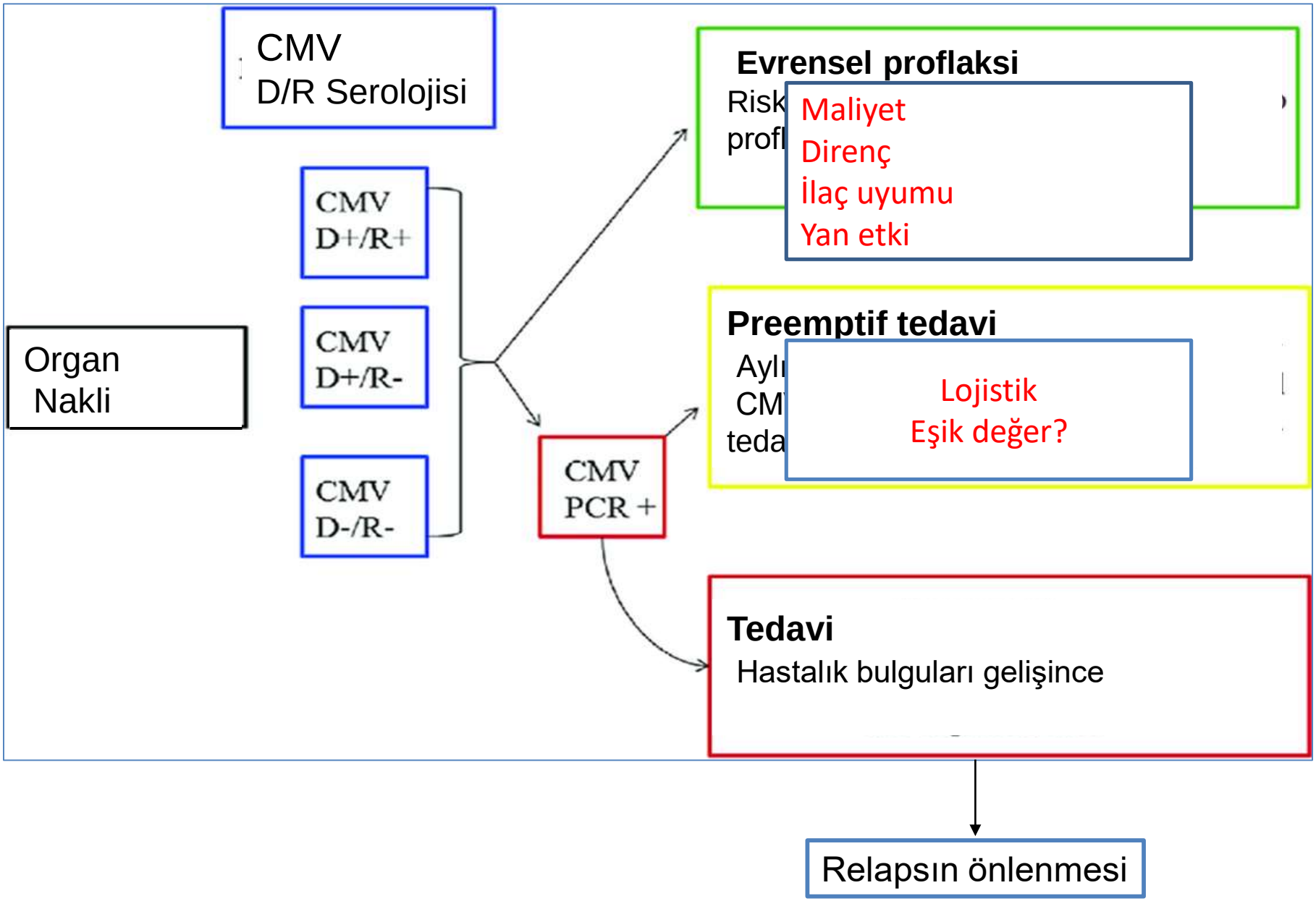
Kantitatif PCR

- Preemptif tedavi kararı

- Hastalık tanısı ?
- Hastalık tedavisi takibi?
- Relaps?



CMV yönetim stratejileri



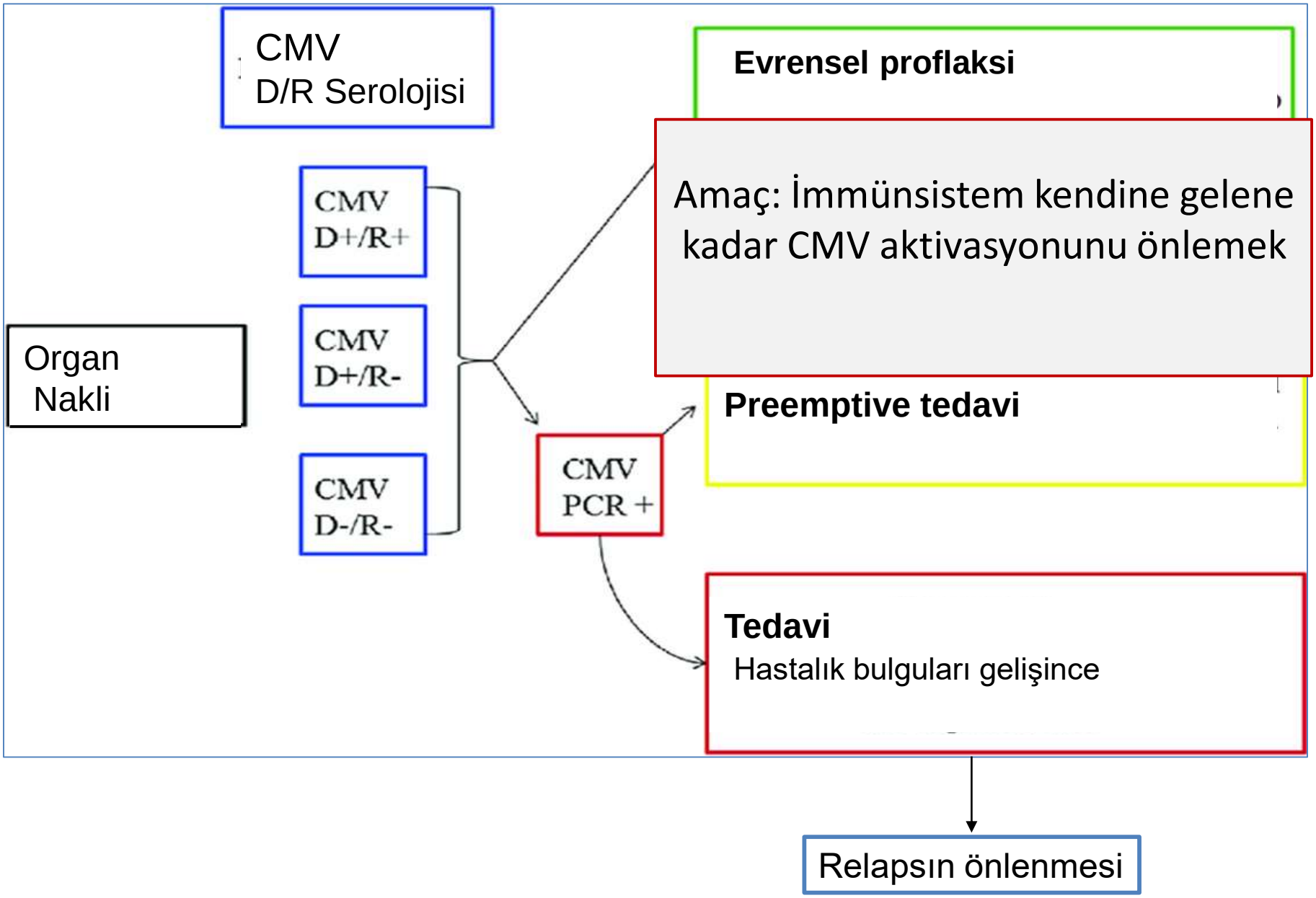
CMV yönetim stratejileri

2.Kantitatif Nükleik Asit testleri

Preemptif tedavi :

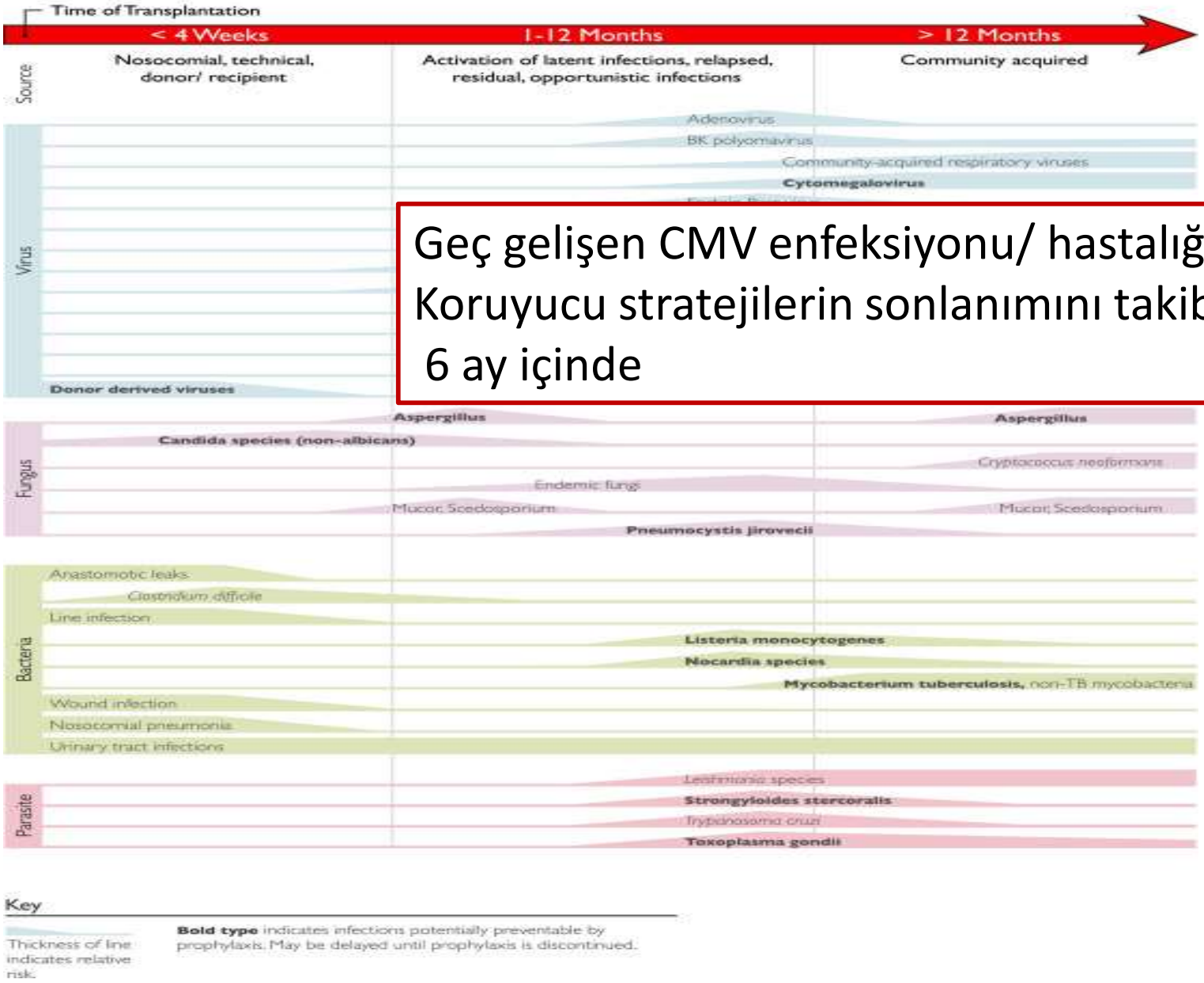
- Bugün için kabul edilmiş viral yük eşik değeri yok
- Haftalık takiplerdeki titre artışı mutlak viral yük düzeyinden daha önemli

- **KNAT da kantifikasyon limitleri önemli:**
  - BEDVY <1000 kopya/ml olan testlerde en az 3 kat artış
  - BEDVY >1000 kopya/ml olan testlerde en az 5 kat artış



CMV yönetimi stratejileri

Timeline of Common Post-Transplant Infections



Geç gelişen CMV enfeksiyonu/ hastalığı
Koruyucu stratejilerin sonlanımını takiben
6 ay içinde

Key

Thickness of line indicates relative risk

Bold type indicates infections potentially preventable by prophylaxis. May be delayed until prophylaxis is discontinued.

Stratejiler neden herkeste işe yaramıyor?

- Bireysel riskler
  - R- nakil
  - R+ ancak immün yanıtsız nakil
  - Genetik faktörler

- Nakil ilişkili riskler
  - Nakil tipi
  - Doku uyumu
  - Nakil indüksiyon tedavisi
  - Rejeksiyon

Hastalik tedavisi sonrası reaktivasyon riski takibi?

Yüksek riskli hastalarda tedavi bitiminden sonra gelişen CMV aktivasyonunu önlemek için aylık viral yük takibi?

- Kantitatif PCR tekniği ve etkin antiviral tedaviye dayalı stratejiler CMV aktivasyonu direkt/ indirekt etkileri açısından hala büyük bir sorun

- Sorunun çözümü için her bir alıcı adayı için bireysel değerlendirme gerekiyor

4.CMV’de İmmüntakip yöntemleri

Anadolu'nun yükselen yıldızı Çorum...

Stratejiler neden herkeste işe yaramıyor?

- Bireysel riskler
  - R- nakil
  - R+ ancak immün yanıtsız nakil
  - Genetik faktörler
  - Altta yatan hastaliklar
  - Koinfeksiyonlar

- Nakil ilişkili riskler
  - Nakil tipi
  - Doku uyumu
  - Nakil indüksiyon tedavisi
  - Rejeksiyon

Viruses **2014**, *6*, 2242-2258; doi:10.3390/v6062242

CMV İmmünolojisi

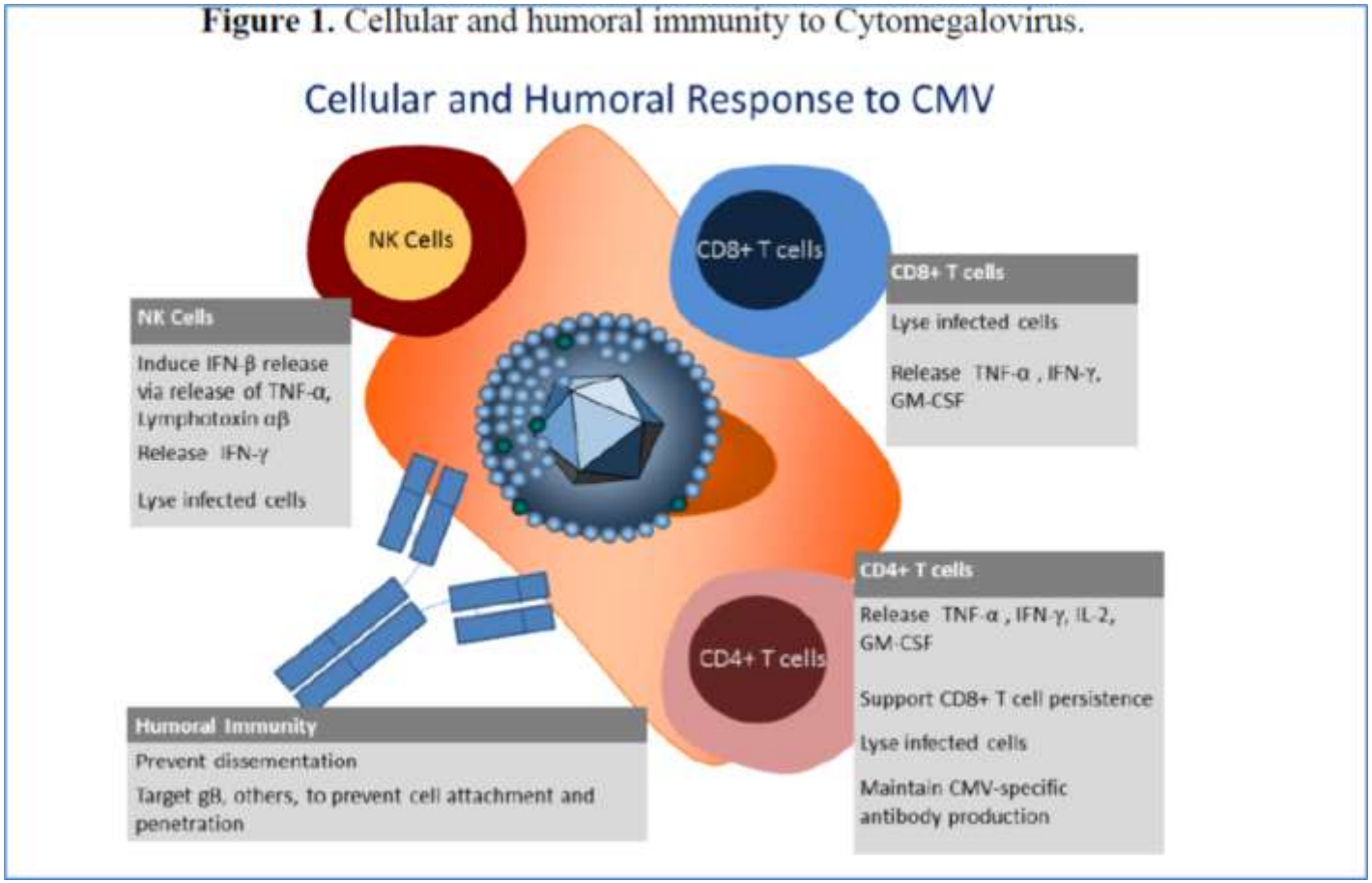
OPEN ACCESS
viruses
ISSN 1999-4915
www.mdpi.com/journal/viruses

Review

Controlling Cytomegalovirus: Helping the Immune System Take the Lead

Patrick J. Hanley * and Catherine M. Bollard

Figure 1. Cellular and humoral immunity to Cytomegalovirus.



CMV-CMI ölçümü

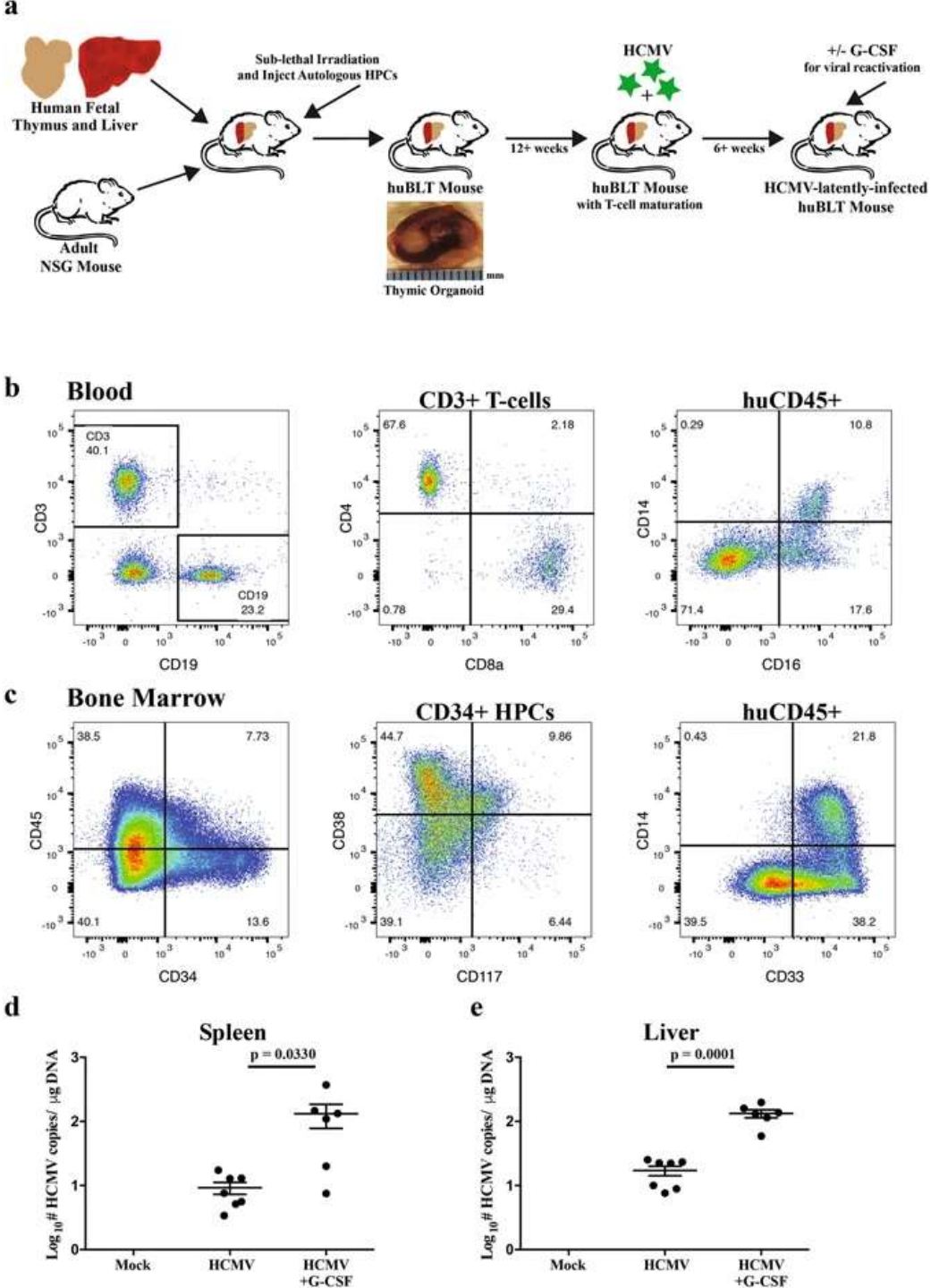
CMV antijeni olan fosfoprotein 65 (pp65) ve IE-1'e yanıt olarak T hücresi aracılı IFN-Y üretiminin efektör immün yanıtlarını ölçer

- **Kullanılan yöntemler:**
  - Akış sitometrisi ile hücre içi sitokin boyama (ICS)
  - Interferon (IFN)-γ salınım tahlili

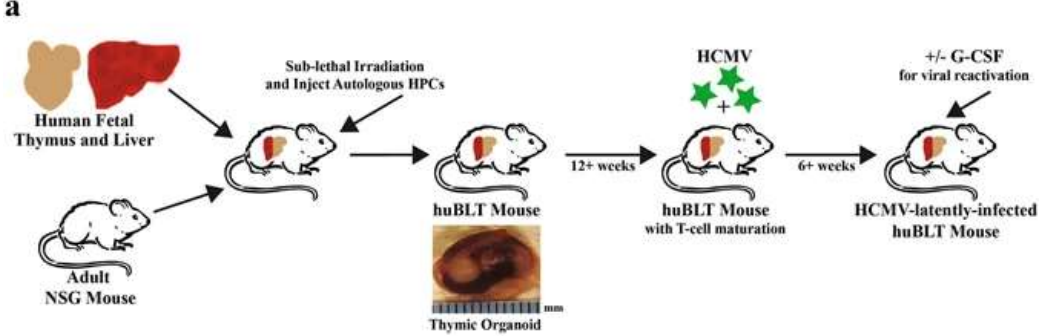
Ticari olarak mevcut olanlar:

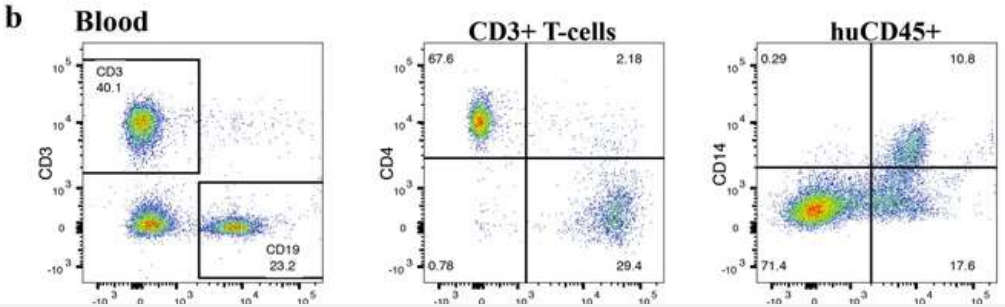
- QuantiFERON®-CMV (QTF-CMV) (Qiagen, Hilden; Almanya)
- T-SPOT®.CMV (Oxford Immunotec, Abingdon, Birleşik Krallık)
- T -Track®CMV (Mikrogen, Neuried, Almanya)

ICS


a
Human Fetal
Thymus and Liver
Adult
NSG Mouse
Sub-lethal Irradiation
and Inject Autologous HPCs
huBLT Mouse
Thymic Organoid
12+ weeks
HCMV
huBLT Mouse
with T-cell maturation
6+ weeks
+/- G-CSF
for viral reactivation
HCMV-latently-infected
huBLT Mouse
b
Blood
CD3
CD19
CD3+ T-cells
CD4
CD8a
huCD45+
CD14
CD16
c
Bone Marrow
CD45
CD34
CD34+ HPCs
CD38
CD117
huCD45+
CD14
CD33
d
Spleen
p = 0.0330
Log10# HCMV copies/ μg DNA
Mock
HCMV
HCMV
+G-CSF
e
Liver
p = 0.0001
Log10# HCMV copies/ μg DNA
Mock
HCMV
HCMV
+G-CSF

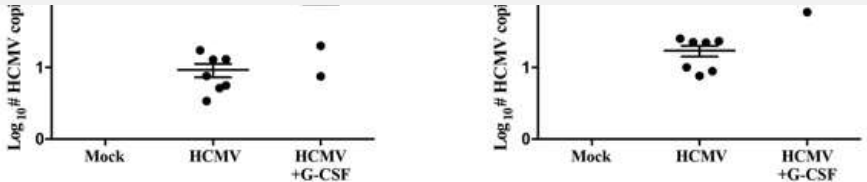
ICS



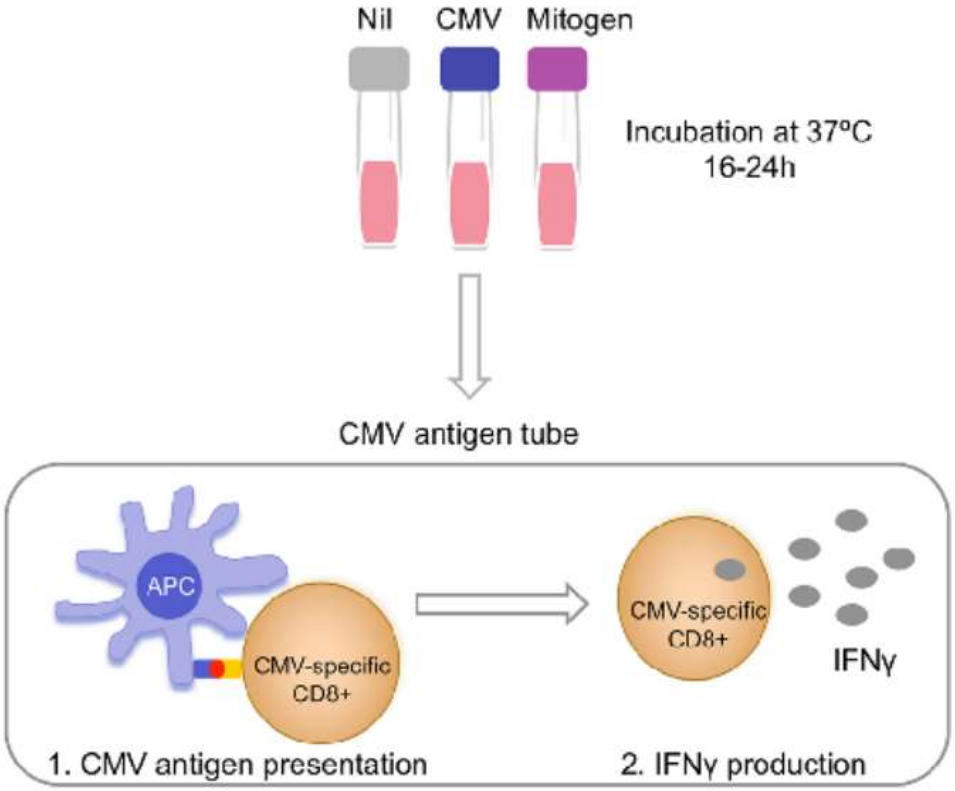


- CD4+ ve CD8+ T Hücrelerinin Tanımlanması
- Aynı gün sonuç
- HLA tipinden etkilenmeyen sonuçlar

- Akış sitometrisi gerekliliği
- Standart cut-off değerlerinin olmaması

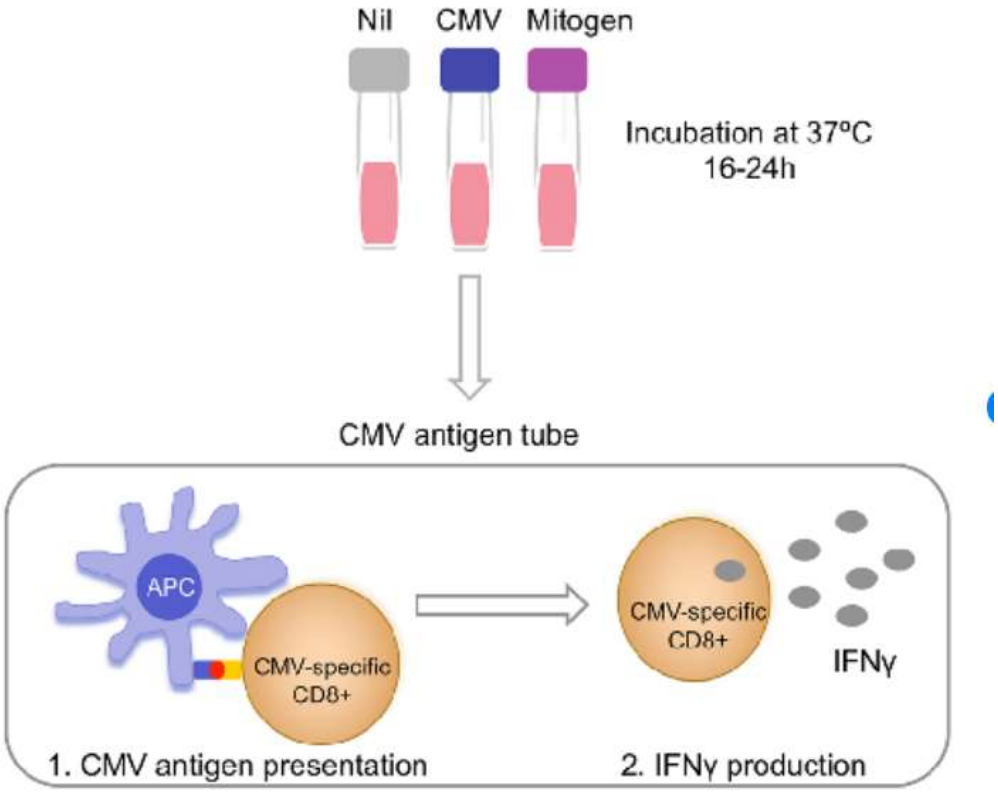


CMV Quantiferon



Schematic representation of QuantiFERON-CMV assay. In the cytomegalovirus antigen tube, CMV-specific CD8? T cells of patients who have been previously exposed to the virus recognize cytomegalovirus antigen and respond by secreting interferon-c

CMV Quantiferon

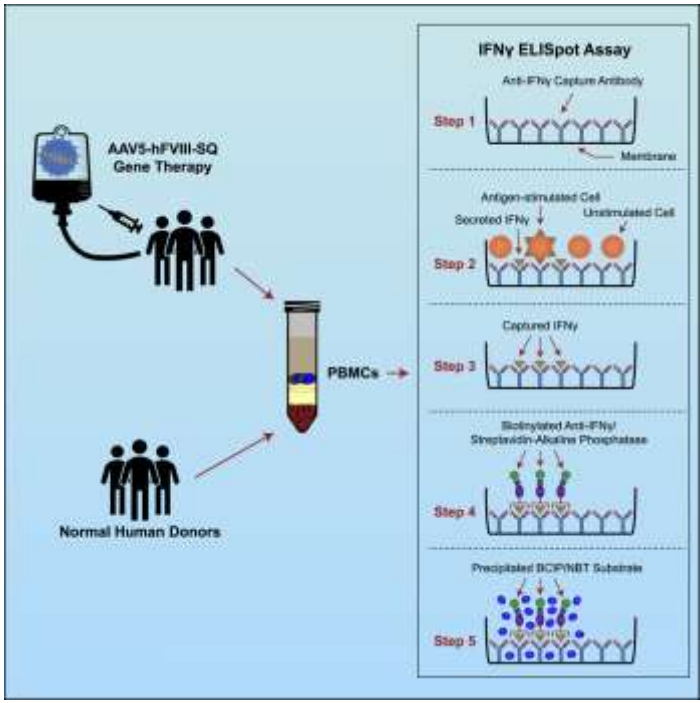


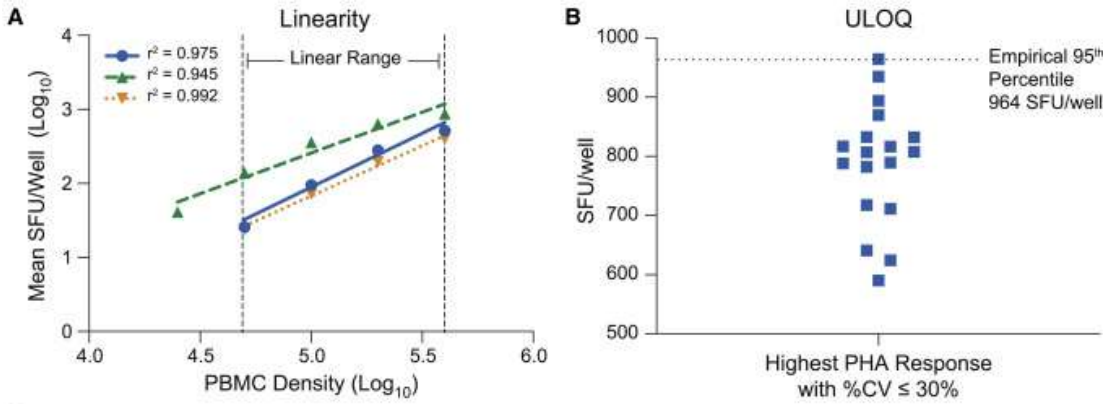
Schematic representation of QuantiFERON-CMV assay. In the cytomegalovirus antigen tube, CMV-specific CD8? T cells of patients who have been previously exposed to the virus recognize cytomegalovirus antigen and respond by secreting interferon-c

- Standart Cutt-of değerleri
- CD8 T hücre yanıtı
- Analitik süresi yaklaşık 2-3 gün

- HLA tipleri test sonucunu etkiliyor

ELISpot





- CD4+/CD8+ yanıtlarını ölçer; ancak sonuçlar ayırt edilemez
- HLA tipinden bağımsız
- Analitik süreç 2-3 gün
- Standart cut-off değeri yok

CMV-Quantiferon/Elispot pozitifliği konak CMV immun yanıtının var olduğunu gsterir

ESOT | Transplant International

REVIEW
published: 07 November 2023
doi: 10.3389/ti.2023.11963

Cytomegalovirus Cell-Mediated Immunity: Ready for Routine Use?

Oriol Bestard[1,2], *Hannah Kaminski*[3,4], *Lionel Couzi*[3,4], *Mario Fernández-Ruiz*[5,6,7] and *Oriol Manuel*[8]*

CMV İmmüntakip yöntemlerinin kullanılabileceği klinik durumlarla ilgili **gözlemsel** çalışmalar

TABLE 1 | Summary of observational studies assessing the potential application of CMV-CMI monitoring in different clinical scenarios.

Clinical scenario	Predicted event	Supporting studies	Monitoring method	Proposed intervention

- Yüksek riskli hastalarda ((R-) / akciğer,barsak) proflaksi süresi belirlem
- Orta riskli hastalarda proflaksi veya preemptif takip süresi belirleme
- Asemptomatik düşük viral yükün tedavisiz takibi
- Hastalık sonrası tedavi süresi ve preemptif takip belirleme
- Rejeksiyon sonrası stratejilerin yeniden belirlenmesi

Çalışma düzenlemeleri birbirinden farklı bu nedenle günümüze yansıyan veriler sınırlı klinik uygulamaya katkısı?

TABLE 1 | Summary of observational studies assessing the potential application of CMV-CMI monitoring in different clinical scenarios.

Clinical scenario	Predicted event	Supporting studies	Monitoring method	Proposed intervention
High-risk patients (D+/R−, T-cell-depleting antibodies, lung transplantation) during antiviral prophylaxis or at the time of discontinuation	Late-onset disease[a]	Yes [43, 46, 48–58]	QTF-CMV, ELISpot	Prolong antiviral prophylaxis or close monitoring for viremia if inadequate response
Pre-transplant assessment in intermediate-risk patients (R+ with no other factors)	Post-transplant viremia and/or disease	Yes [4, 44, 47, 51, 59, 60]	QTF-CMV, ELISpot, ICS	Initiate antiviral prophylaxis or close monitoring for viremia in patients with inadequate response ($D+/R_{NR}$)
Intermediate-risk patients (R+) on preemptive therapy with no concurrent viremia	Subsequent viremia and/or disease	Yes [42, 44, 49, 51, 52, 61–64]	ICS, QTF-CMV, ELISpot, MHC-tetramer staining	Reduce the frequency and/or discontinue monitoring of viremia if adequate response
Intermediate-risk patients (R+) on preemptive therapy with asymptomatic viremia	Spontaneous clearance	Yes [65, 66]	QTF-CMV	Withhold antiviral therapy if adequate response
Active CMV infection or disease during antiviral treatment	Response to antiviral treatment	No		Decrease immunosuppression and/or modify antivirals if inadequate response
Active CMV infection or disease after discontinuation of antiviral treatment	Post-treatment relapse	Yes [67]	ICS	Initiate secondary prophylaxis if inadequate response
Acute graft rejection treated with steroid boluses and/or T-cell-depleting antibodies	Disease following anti-rejection therapy	No		(Re)initiate prophylaxis if inadequate response

Original Clinical Science—General

The Third International Consensus Guidelines on the Management of Cytomegalovirus in Solid-organ Transplantation

Camille N. Kotton, MD,[1] Deepali Kumar, MD,[2] Angela M. Caliendo, MD, PhD,[3] Shirish Huprikar, MD,[4] Sunwen Chou, MD,[5] Lara Danziger-Isakov, MD, MPH,[6] and Atul Humar, MD[7]
on behalf of the The Transplantation Society International CMV Consensus Group

Abstract: Despite recent advances, cytomegalovirus (CMV) infections remain one of the most common complications affecting solid organ transplant recipients, conveying higher risks of complications, graft loss, morbidity, and mortality. Research in the field and development of prior consensus guidelines supported by The Transplantation Society has allowed a more standardized approach to CMV management. An international multidisciplinary panel of experts was convened to expand and revise evidence and expert opinion-based consensus guidelines on CMV management including prevention, treatment, diagnostics, immunology, drug resistance, and pediatric issues. Highlights include advances in molecular and immunologic diagnostics, improved understanding of diagnostic thresholds, optimized methods of prevention, advances in the use of novel antiviral therapies and certain immunosuppressive agents, and more savvy approaches to treatment resistant/refractory disease. The following report summarizes the updated recommendations.

(*Transplantation* 2018;102: 900–931)

4.CMV'de İmmüntakip yöntemleri

TABLE 2.

Advantages and limitations of various assays for immune monitoring of CMV

Assay	Advantages	Limitations	Comments	Predict viremia	Predict disease
ICS	Whole blood assay with low blood volume (1 mL) or PBMC Short incubation time Results available after 8 hours Identification of CD4+ and CD8+ T cells Knowledge of HLA not necessarily required Quantitative and qualitative characterization	Needs access to a flow cytometer Not standardized	Most data available with this technique Potential to freeze PBMCs and ship to reference lab for testing	Yes	Yes
QuantiFERON-CMV (Qiagen, USA)	Whole blood assay with low blood volume (3 mL) Simple to perform Results available after 30-40 hours Can be done in any center and stimulated plasma can be sent to reference lab	CD8+ responses only. Sensitive to lymphopenia. Rare patients whose HLA types are not covered in assay	Approved in Europe	Yes	Yes
ELISpot	Identifies both CD4+/CD8+ T cells Knowledge of HLA not necessarily required Results available after 30-40 hours	Need for purified PBMC from 10 mL blood (in reality 5-10 mL) Cannot differentiate CD4+ and CD8+ T cells Not standardized	Potential to freeze PBMCs and ship to reference lab for testing; Commercial availability (T-Track CMV, Lophius CE marked in Europe; T-SPOT.CMV is LDT in U.S.) and CE marked in Europe	Yes	Yes
MHC multimer staining	Fast assay (1-2 h) Whole blood assay with low blood volume (0.5-1 mL) or PBMC	CD8+ responses only Needs access to a flow cytometer HLA and epitope-specific. No information about function unless combined with ICS Not standardized	Unlikely to be used on a widespread basis	No, Only in combination with functional or phenotypical markers	No

Nasıl?

TABLE 3.

Potential clinical uses and management based on CMV-specific immune monitoring

Clinical settings	Viral load	Immune monitoring result[a]	Action	Interpretation
Pretransplant				
Pretransplant R+		Neg	Prophylaxis or surveillance	Indicates low level protection
Pretransplant Seropositive patients with potential passive antibodies		Neg		Passive immunity; T cells are not transferred
		Pos		True Infection
Posttransplant prophylaxis				
End of prophylaxis		Pos	Stop prophylaxis	Indicates protection
		Neg	Continue prophylaxis or stop prophylaxis and do surveillance	Indicates lack of protection
Posttransplant preemptive therapy				
Asymptomatic R+ patients (>1 month posttransplant)	Neg	Pos	Continue surveillance	Low risk, indicates protection
	Neg	Neg	Close surveillance	Increased risk, indicates lack of protection
	Pos	Pos	No treatment; close monitoring	Low risk, indicates sufficient immunity
	Pos	Neg	Treatment	Indicates lack of protection
End of treatment	Neg	Pos	Stop treatment	Low risk of relapse, sufficient immunity
	Neg	Neg	Secondary Prophylaxis	High risk of relapse, lack of protection

[a] Positive (or Reactive) immune monitoring result suggests a threshold has been established; viral load negative means below lower limit of quantitation. Limited information in heart and lung transplant recipients and pediatric recipients.

Neg, negative; Pos, positive

CMV İmmüntakip yöntemlerinin kullanılabileceği klinik durumlarla ilgili **müdahaleli** çalışmalar

TABLE 3 | Summary of the intervention studies on the application of CMV-CMI assays in SOT recipients.

Study author	Number of patients	Type of organ transplant	CMV serostatus	Cell-mediated immune assay	Intervention	Main results
[106]	118	Lung	R+ and D+/R–	QTF-CMV	Test at 5, 8 and 11 months, stop prophylaxis if test positive	Lower CMV replication in the allograft and longer duration of antiviral prophylaxis in the intervention group
[107]	150	Kidney	R+ on ATG	QTF-CMV	Test at 30, 45, 60, 90 days, stop prophylaxis if test positive	Similar incidence of CMV replication/ disease, shorter duration of antiviral, lower incidence of neutropenia in the intervention group
[108]	185	Kidney (164) and liver (21)	R+ on ATG and D+/R–	T-Track-CMV	Test at 30, 60, 90 days (R+ and D+/R–), 120, 150, 180 (D+/R–), stop prophylaxis if test positive	Similar incidence of CMV replication/ disease, shorter duration of antiviral in the intervention group
[109]	27	All SOT	R+ and D+/R–	QTF-CMV	Test at the end of therapy for CMV replication, add secondary prophylaxis in case of negative result	Lower incidence of CMV relapse in patients with a positive test
[110]	160	Kidney	R+	T-SPOT.CMV	Stratify patients at transplant in low vs. high-risk according to test result. Then randomize to preemptive vs. prophylaxis	Higher incidence of CMV replication in high-risk group. Better performance of antiviral prophylaxis strategy in both groups

Clinical Infectious Diseases

MAJOR ARTICLE

Immunoguided Discontinuation of Prophylaxis for Cytomegalovirus Disease in Kidney Transplant Recipients Treated With Antithymocyte Globulin: A Randomized Clinical Trial

Aurora Páez-Vega,[1,2] Belén Gutiérrez-Gutiérrez,[2,3] Maria L. Agüera,[1,4] Carme Facundo,[5] Dolores Redondo-Pachón,[6] Marta Suñer,[7] Maria O. López-Oliva,[8] Jose R. Yuste,[2,9] Miguel Montejo,[2,10] Cristina Galeano-Álvarez,[11] Juan C. Ruiz-San Millan,[12] Ibai Los-Arcos,[2,13] Domingo Hernández,[14] Mario Fernández-Ruiz,[2,15] Patricia Muñoz,[16] Jorge Valle-Arroyo,[1,2] Angela Cano,[1,2] Alberto Rodríguez-Benot,[1,4] Marta Crespo,[6] Cristian Rodelo-Haad,[1,4] Maria A. Lobo-Acosta,[17] Jose C. Garrido-Gracia,[18] Elisa Vidal,[1,2,19] Luis Guirado,[5] Sara Cantisán,[1,2] and Julian Torre-Cisneros[1,2,19]; on behalf of the TIMOVAL Study Group

- Açık uçlu, non inferiority amaçlayan klinik çalışma
- İndüksiyon tedavisinde ATG alan R+ Böbrek alıcılarında
- (CMV-Quantiferon)
- 1 **X** 1 randomize
  90 gün proflaksi **X** CMV-CMI pozitifleştiğinde proflaksi kesiliyor

- Sonraki 6 ay viremi takibi ve preemptiv tedavi uygulaması
- 12 ay süre ile takip

Table 1. Ordinal Outcomes for Efficacy, Safety, and Benefit-Risk Analyses With Categories in Ascending Order of Desirability

Analyses	Outcome
Efficacy	1. CMV disease/replication
	2. No CMV disease/replication
Safety	1. Neutropenia
Benefit-Risk	1. No CMV disease/replication without neutropenia
	2. No CMV disease/replication with neutropenia
	3. CMV disease/replication without neutropenia
	4. CMV disease/replication with neutropenia

Desirability of outcome ranking analysis was defined post hoc. Neutropenia: <1500 neutrophils/mm^3.

Abbreviation: CMV, cytomegalovirus.

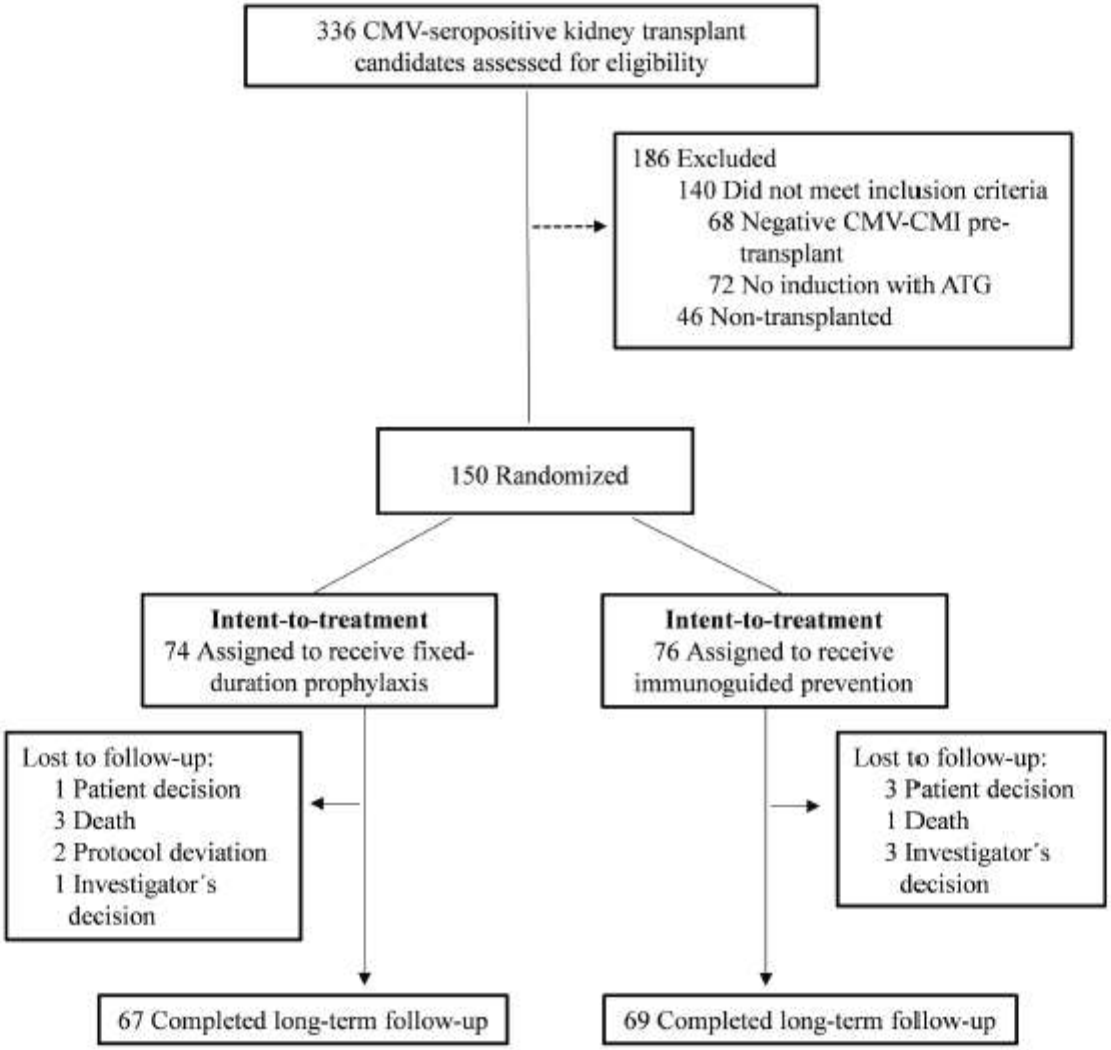


Figure 1. Patient flow through the study. Abbreviations: ATG, antithymocyte globulin; CMI, cell-mediated immunity; CMV, cytomegalovirus.

Table 4. Results of the QuantiFERON Cytomegalovirus Assay Performed in the Immunoguided Group (76 Patients)

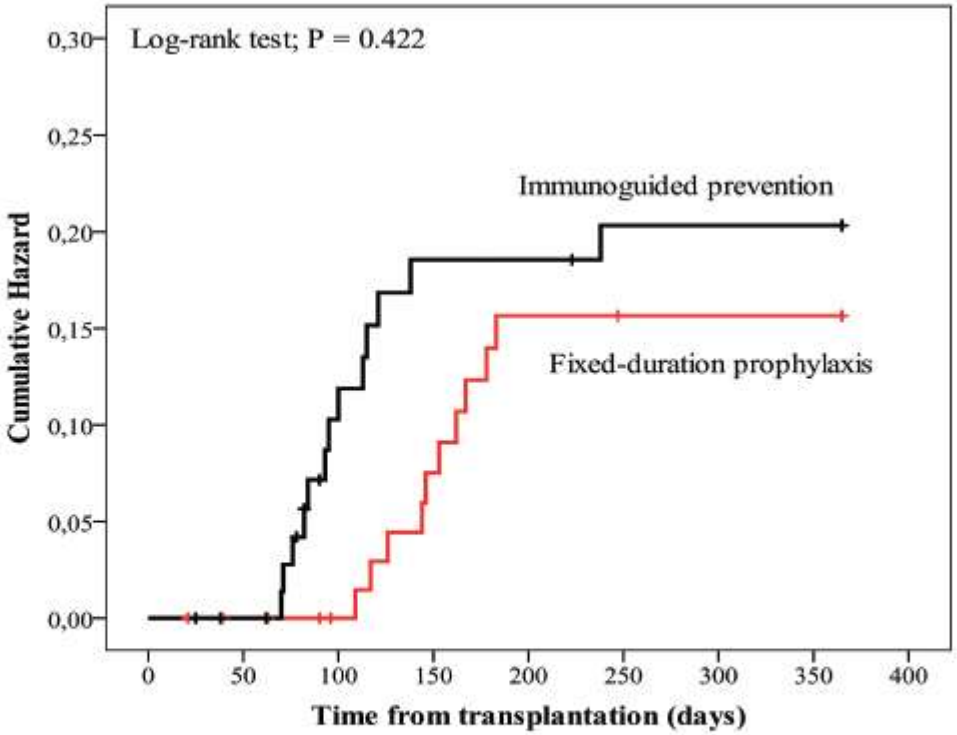
	Time Point			
Parameter	**Day 30**	**Day 45**	**Day 60**	**Day 90**
Patients with QuantiFERON-CMV assay results[a]	74 (97.3)	73 (96.1)	72 (94.7)	72 (94.7)
Negative	16 (21.1)	22 (28.9)	23 (30.3)	18 (23.7)
Indeterminate	24 (31.6)	11 (14.5)	4 (5.3)	2 (2.6)
Positive	34 (44.7)	40 (52.6)	45 (59.2)	52 (68.4)
Interferon-gamma, median (interquartile range), IU/mL	2.4 (0.9–9.4)	2.9 (1.0–11.7)	3.6 (1.2–14.0)	8.1 (1.0–16.
Discontinuation of prophylaxis[b]	32 (42.1)	7 (9.2)	6 (7.9)	28 (36.8)

Table 3. Outcome of Selected End Points for DOOR Analysis (Intent-to-Treat Population)

End points	Immunoguided Prevention (n = 76)	Fixed-Duration Prophylaxis (n = 74)	*P* Value
Primary outcome			
Incidence of CMV disease	0 (0.0)	2 (2.7)	.243
Secondary outcome			
Incidence of CMV replication	13 (17.1)	10 (13.5)	.542
DOOR at 12 months			
No CMV disease/replication without neutropenia	57 (75.0)	39 (52.7)	<.001
No CMV disease/replication with neutropenia	6 (7.9)	25 (33.8)	<.001
CMV disease/replication without neutropenia	12 (15.8)	7 (9.5)	.248
CMV disease/replication with neutropenia	1 (1.3)	3 (4.1)	.323
DOOR components at 12 months			
CMV disease/replication	13 (17.1)	10 (13.5)	.542
Neutropenia	7 (9.2)	28 (37.8)	<.001

Data are presented as no. (%) unless otherwise indicated. DOOR analysis was performed. For this analysis, the composite variable of incidence of CMV disease or replication was considered. Given that the 2 patients with CMV disease also had CMV replication, only 1 event was considered in these patients. Neutropenia: <1500 neutrophils/mm^3.

Abbreviations: CMV, cytomegalovirus; DOOR, desirability of outcome ranking.



Number at risk								
Immunoguided prevention	76	74	62	58	58	56	56	56
Fixed-duration prophylaxis	74	72	69	64	59	58	58	58

Table 5. Overview of Safety and Common Adverse Events (Incidence ≥10%) in Either Arm

Adverse events	Immnunoguided Prevention (n = 76)	Fixed-Duration Prophylaxis (n = 74)	*P* Value[a]
Overview of safety			
Patients with any adverse event	44 (57.9)	51 (68.9)	.161
Patients with serious adverse events	14 (18.4)	18 (24.3)	.378
All-cause mortality at 12 months	1 (1.3)	3 (4.1)	.363
Common adverse events[b]			
Neutropenia[c]	7 (9.2)	28 (37.8)	<.001
Increased blood creatinine[d]	23 (30.3)	19 (25.7)	.532
Urinary tract infection[e]	12 (15.8)	11 (14.9)	.875
Biopsy-proven acute rejection	12 (15.8)	8 (10.8)	.370
Diarrhea	8 (10.5)	4 (5.4)	.248

Data are presented as no. (%) unless otherwise indicated.

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Sonuç olarak;

- ATG indüksiyon tedavisi alan seropozitif böbrek nakil alıcılarında
  - CMV-CMI rehberliğinde korunma; rutin proflaksiden daha az başarılı değildir
  - İlaç yan etki oranları daha düşüktür

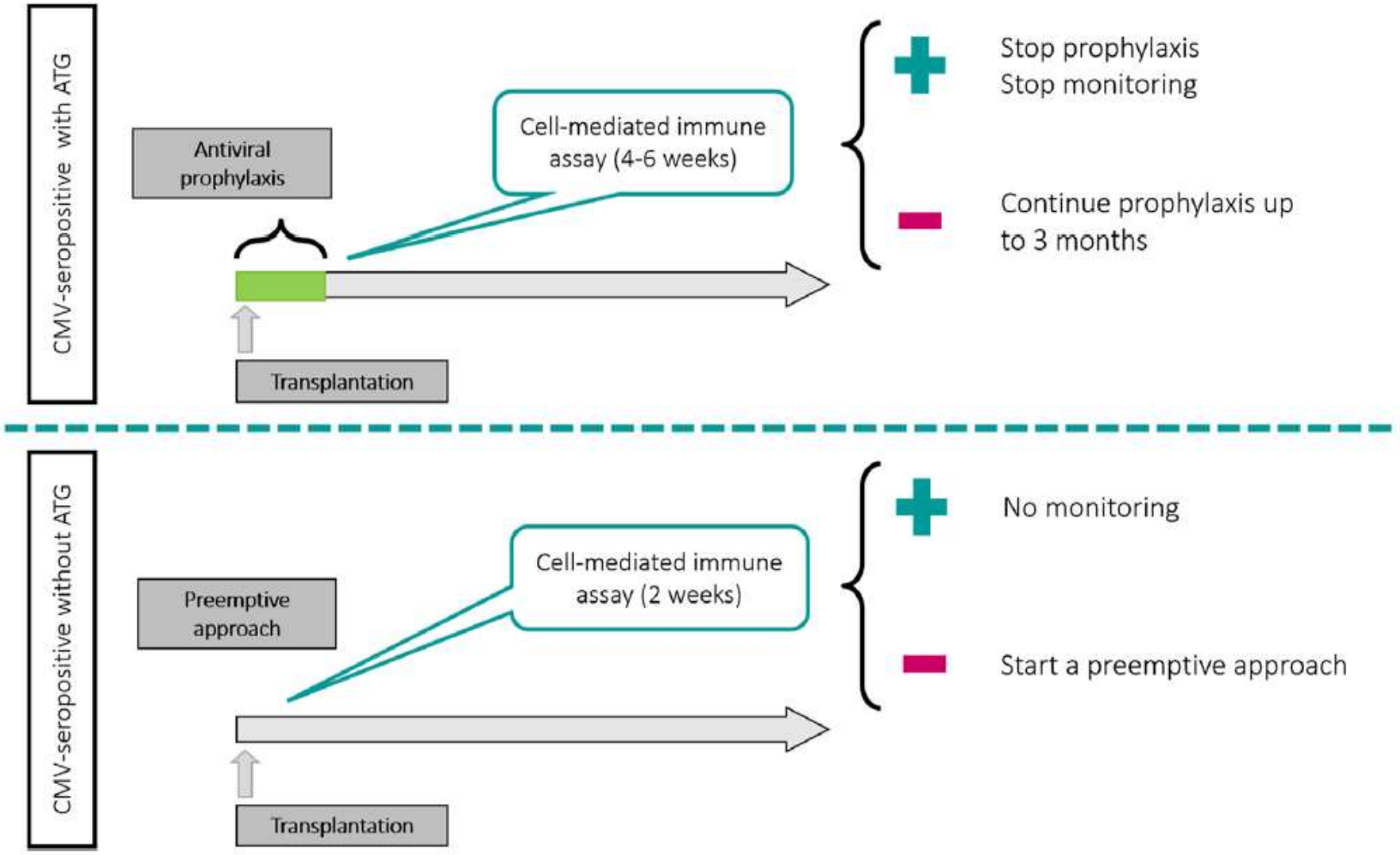


FIGURE 2 | Potential uses of CMV-CMI assays in CMV-seropositive patients according to preventive strategy and use of T-cell depleting antibodies.

Atıl Kumar
Camille Cotton
24 Eylül

ATG kullanılan R+ böbrek alıcıları için (ATG alanlar için daha kuvvetli olarak) aylık CMI takibi ve buna göre proflaksi süresi belirlemeyi öneriyor

CMV aktivasyonu kimlerde görülür?

- Solid Organ Nakli Hastaları
- Kök Hücre Nakli hastaları

- AIDS hastaları

- Onkolojik maligniteler
- Septik şok hastaları/ Yanık hastaları
- İnflamatuvar barsak hastalıkları
- Otoimmun hastalıklar

- ‘İmmünosenesens’

CMV

(**C**ucumber M**o**saic V**i**rus)

CMV Yönetimi;

Hastanın durumunu belirleme

Nakil öncesi

Serolojik durumun belirlenmesi

Anti-CMV IgG

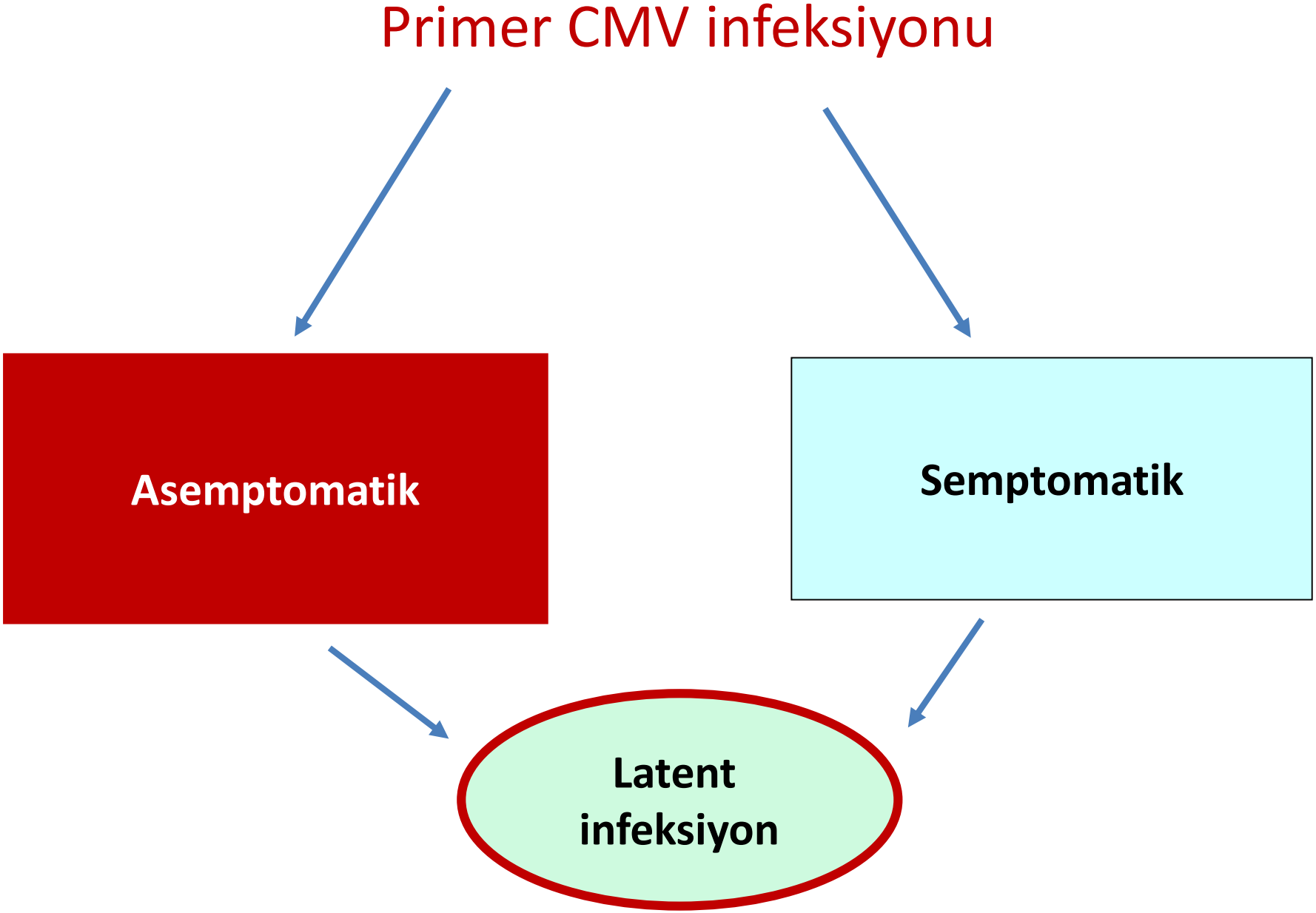
– Sonuç: CMV D+/R+ gibi belirlenmeli

Anti-CMV IG M/ total Anti-CMV

– ÖNERİLMEZ

Nakil Sonrası

- Seroloji *Kullanılmaz* !
- Kantitatif Nükleik Asit testleri
- Antijenemi
- CMV spesifik immün takip
- Histopatoloji


Primer CMV infeksiyonu
Asemptomatik
Semptomatik
Latent
infeksiyon

2.Kantitatif Nükleik Asit testleri

Hastalık tanısı:

Clinical Infectious Diseases

MAJOR ARTICLE

IDSA Infectious Diseases Society of America

hivma hiv medicine association

OXFORD

Consensus Definitions of Cytomegalovirus (CMV) Infection and Disease in Transplant Patients Including Resistant and Refractory CMV for Use in Clinical Trials: 2024 Update From the Transplant Associated Virus Infections Forum

Per Ljungman,[1,2,●] Roy F. Chemaly,[3] Fareed Khawaya,[3] Sophie Alain,[4] Robin Avery,[5] Cyrus Badshah,[6] Michael Boeckh,[7,8] Martha Fournier,[9] Aimee Hodowanec,[10] Takashi Komatsu,[10] Ajit P. Limaye,[11] Oriol Manuel,[12] Yoichiro Natori,[13] David Navarro,[14,15] Andreas Pikis,[10] Raymund R. Razonable,[16,17,●] Gabriel Westman,[18,19] Veronica Miller,[20] Paul D. Griffiths,[21] and Camille N. Kotton[22]; for the CMV Definitions Working Group of the Transplant Associated Virus Infections Forum

2.Kantitatif Nükleik Asit testleri

Hastalık tanısı:

- Son Organ hastalığı kesin tanısı histopatolojik inceleme
- Kanda CMV
  - DNAemi replikasyonu gösterir
  - Negatif Prediktif Değeri yüksek (GİS tutulumu hariç)
- Vücut sıvılarında CMV
  - BAL
    - » Negatif prediktif değeri yüksek
    - » Çok yüksek değerler hastalık lehine değerlendirilebilir